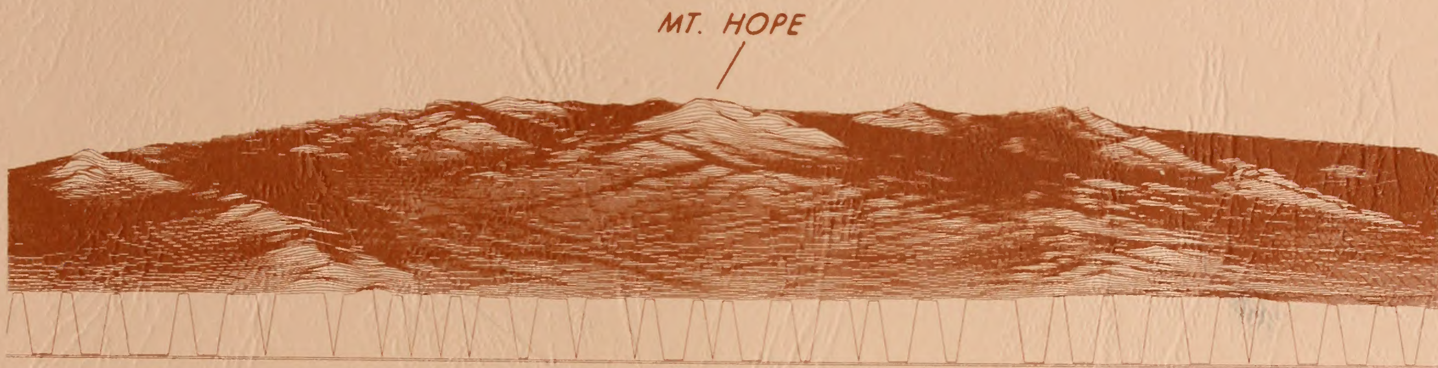
LAND USE, TRANSPORTATION AND NOISE

TECHNICAL REPORT NO.8

MT. HOPE MOLYBDENUM PROJECT



View from the south looking north

U.S. DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
BATTLE MOUNTAIN, NEVADA

DECEMBER 1984

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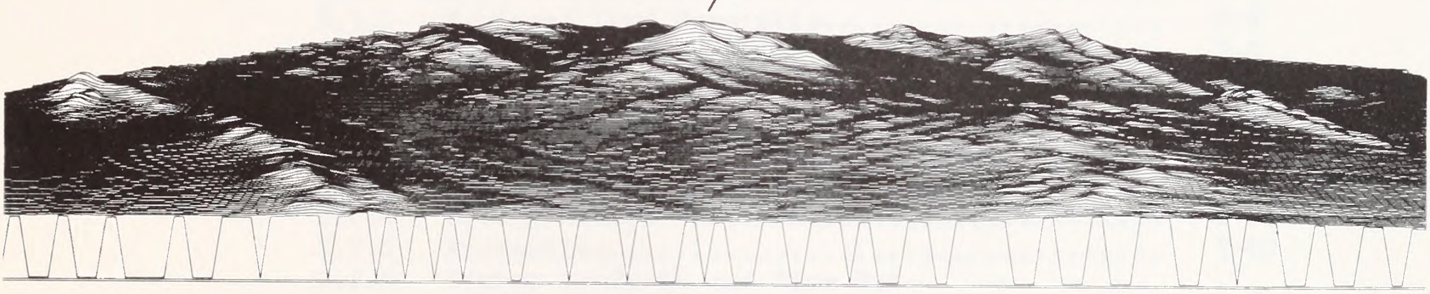

View from the south looking north

U.S. DEPARTMENT OF INTERIOR

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DECEMBER 1984

LAND USE, TRANSPORTATION AND NOISE

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CHAPTER 1.0

INTRODUCTION

1.1 Introduction

This technical report presents detailed information concerning the existing resource bases of land use, transportation and noise and any significant potential impacts to the quality of those resource bases upon implementation of the proposed action and/or alternatives.

1.2 Project Description

Technical Report No.1 and Chapter 2.0 of the Mt. Hope Molybdenum Project EIS detail the proposed action and alternatives. In brief, the Mt. Hope Molybdenum Project Environmental Impact Statement (EIS) (including Technical Report Nos.1 thru 9) has been prepared in response to an EXXON Minerals Company (EXXON) proposal submitted to the Bureau of Land Management (BLM) for the purchase of public lands under Section 203 of the Federal Land Policy and Management Act (FLPMA) of 1976. Although the land purchase proposal is the action which occasions the Environmental Impact Statement (EIS) process, there are other federal decisions which must be made before EXXON may proceed. Among these are the granting of power, water line and highway relocation rights-of-way and the approval of a plan-of-operation.

The primary purpose of the proposed sale of public lands involves the planned activities of EXXON which has for some time been conducting preliminary feasibility studies assessing the development of a molybdenum deposit in the vicinity of Mt. Hope near Eureka, Nevada. As part of the EIS process, EXXON has detailed its preliminary plans concerning project development. The Mt. Hope project includes the development of an open-pit mine, non-mineralized material storage areas (2), a process plant complex of approximately 100 acres and a tailings material disposal site. As support features to the project, a proposed water line and power line would also be necessary. The proposed tailings pond site would, if implemented, require an approximate six mile relocation of an existing state highway (State Route 278). Information pertinent to power line and State Route 278 activity may be found in Appendix 8-B.

It is estimated that up to 640 full-time operations personnel would be required.

Figures 1-1 through 1-8 show project area location and depict the proposed action and alternatives (except the location of a subdivision plat). It should be noted that Figure 1-2 illustrates the 2,450 acre area which would be purchased under the provisions of FLPMA. Figure 1-7 and 1-8 illustrate the area under EXXON control should a FLPMA sale of 2,450 acres not be completed. Table 1-1 outlines the components of the proposed action and alternatives, including the no action alternative.

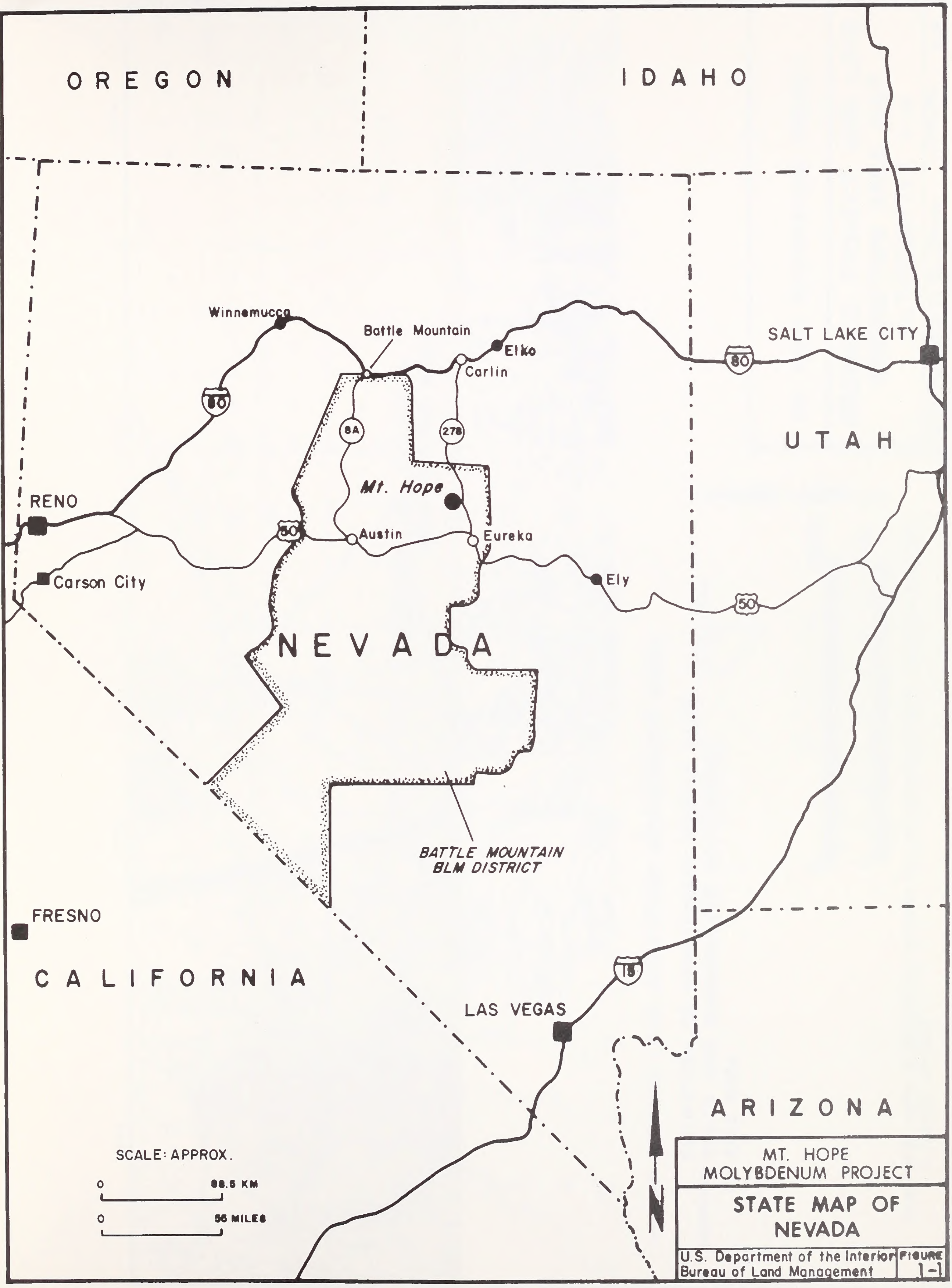
1.3 Baseline Data Development

Early in the EIS process, the BLM and EXXON agreed in a Memorandum of Understanding (MOU) that the EIS process of data collection, analysis and documentation would be assisted by the involvement of an independent third party consultant, Wyatt Research and Consulting, Inc. (WRC). WRC initiated its involvement as an oversight quality assurance consultant in the development of a project source document for subsequent use in developing the Mt. Hope Molybdenum Project EIS. Entitled the Mt. Hope Molybdenum Project Environmental Impact Report (EIR), the source document included two chapters of information concerning environmental resources (baseline data and impact analyses) and prepared by WRC with assistance from the BLM and available study results of EXXON (e.g., cultural resources consultant report, geology, etc.). During the preparation of the source document and continuing throughout the EIS process, WRC has collected, reviewed and analyzed pertinent data in each of the necessary topical areas of environmental resources.

This technical report documents the majority of information gathered and analyzed that was pertinent to those resources related to land use, transportation and noise. The primary sources of resource information related to land use, transportation and noise are included the following:

1) Conger, T. A. (Sharp, Krater, Engstrom and Associates, Inc.) 1974. Eureka County General Plan.

2) Eakin, T. E. 1961 Ground-Water Appraisal of Pine Valley, Eureka and Elko Counties, Nevada, Ground-Water Resources Reconnaissance Series

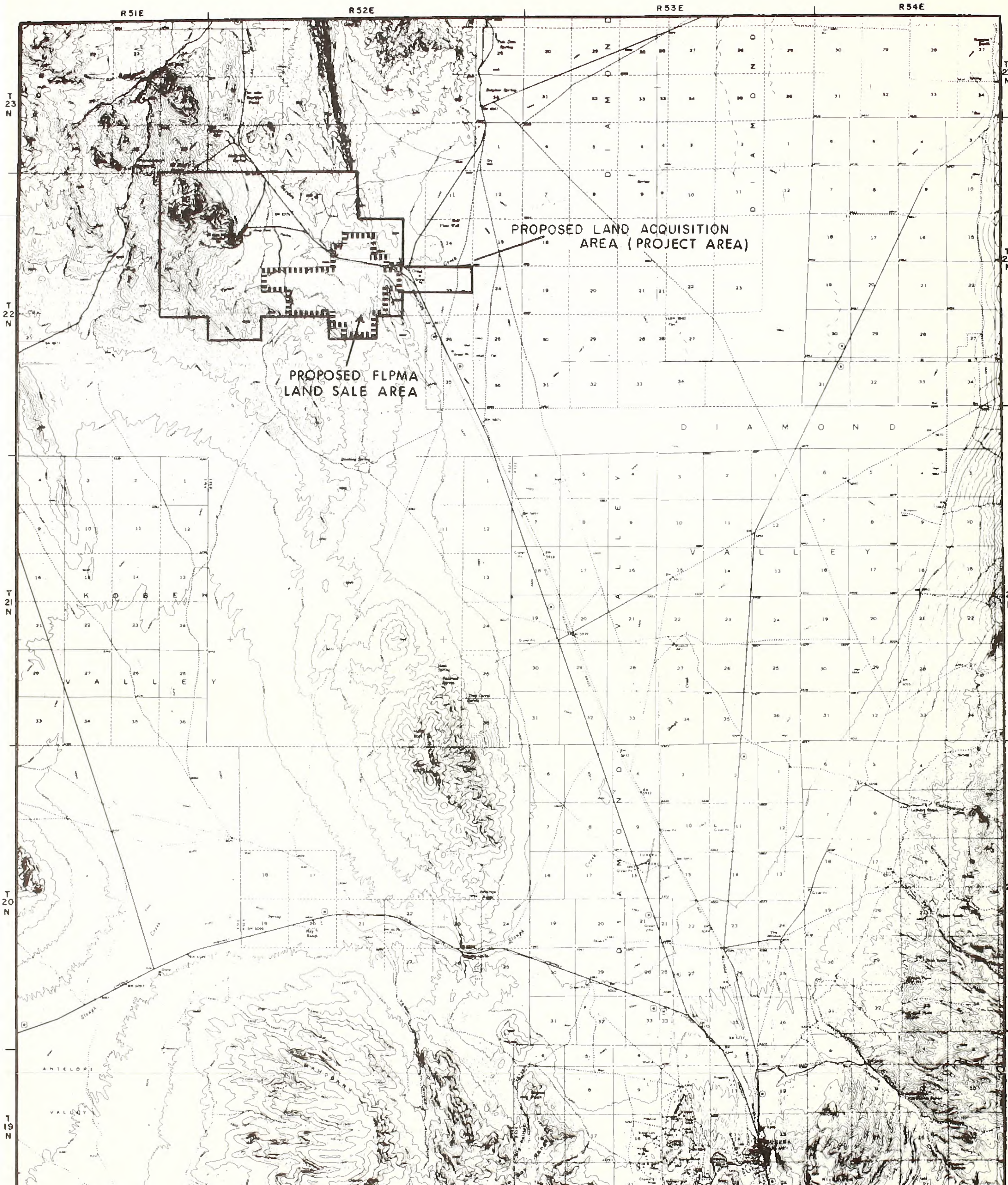


MT. HOPE
MOLYBDENUM PROJECT

STATE MAP OF
NEVADA

U.S. Department of the Interior
Bureau of Land Management

FIGURE
1-1



PROPOSED LAND ACQUISITION AREA (PROJECT AREA)

ESTIMATION OF APPROXIMATE FEDERAL LAND POLICY AND MANAGEMENT ACT (FLPMA) SALE AREA

Nevada MAP AREA

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Km.

N

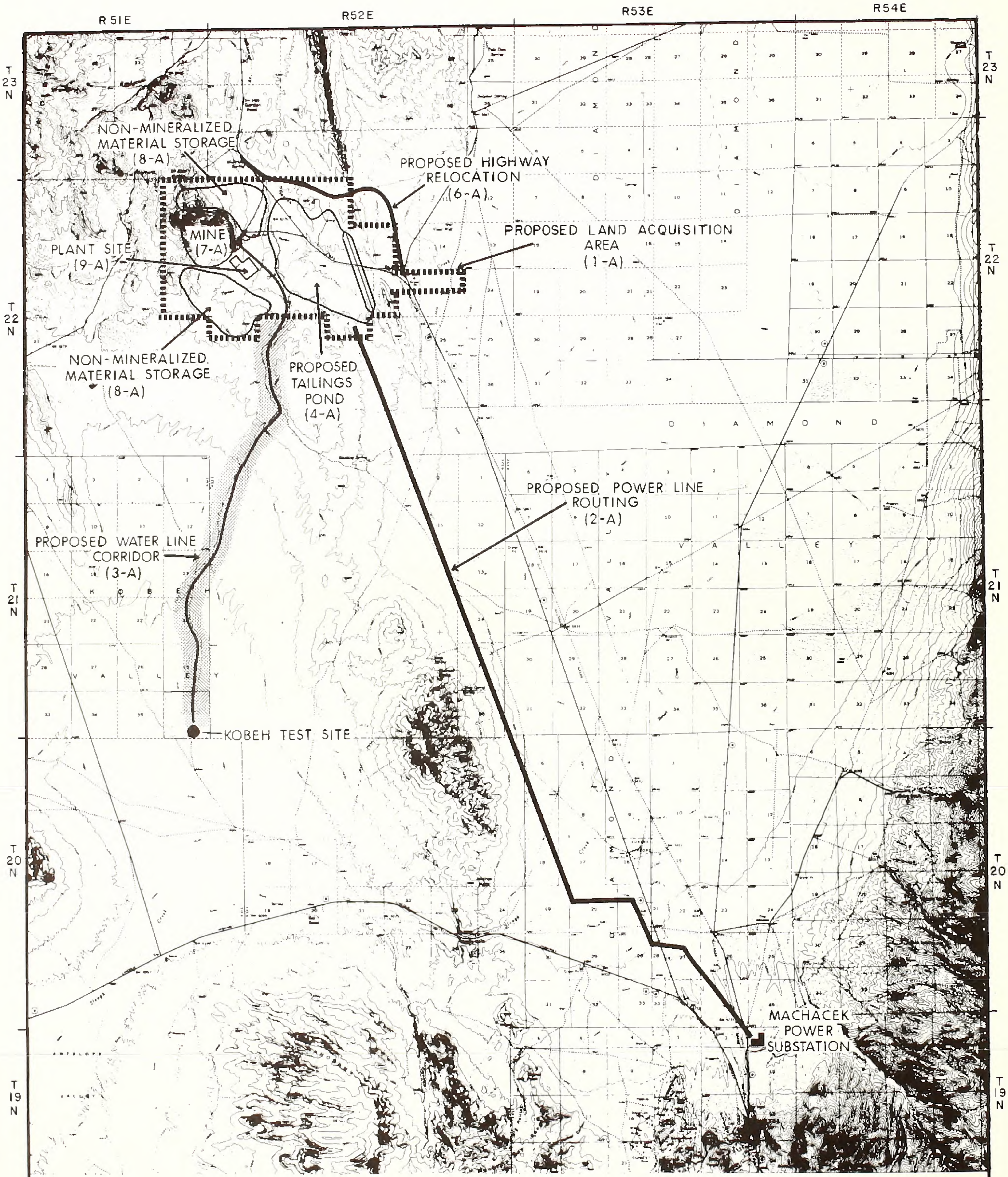
BASE: USGS TOPO QUADRANGLES, GARDEN VALLEY, WHISTLER MTN., DIAMOND SPRINGS & EUREKA, NEVADA.

MT. HOPE MOLYBDENUM PROJECT

PROPOSED PROJECT AND LAND ACQUISITION AREA MAP ALTERNATIVE 1-A

U.S. Department of the Interior
Bureau of Land Management

FIGURE 1-2



PROPOSED LAND ACQUISITION AREA BOUNDARY

*NOTE: COMPONENT 5-A (HOUSING SUBDIVISION) NOT SHOWN.
ALTERNATIVE 1-A (INCLUDING FLPMA LAND SALE AREA) SHOWN ON FIGURE 2-1.

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Km.

Nevada MAP AREA

N

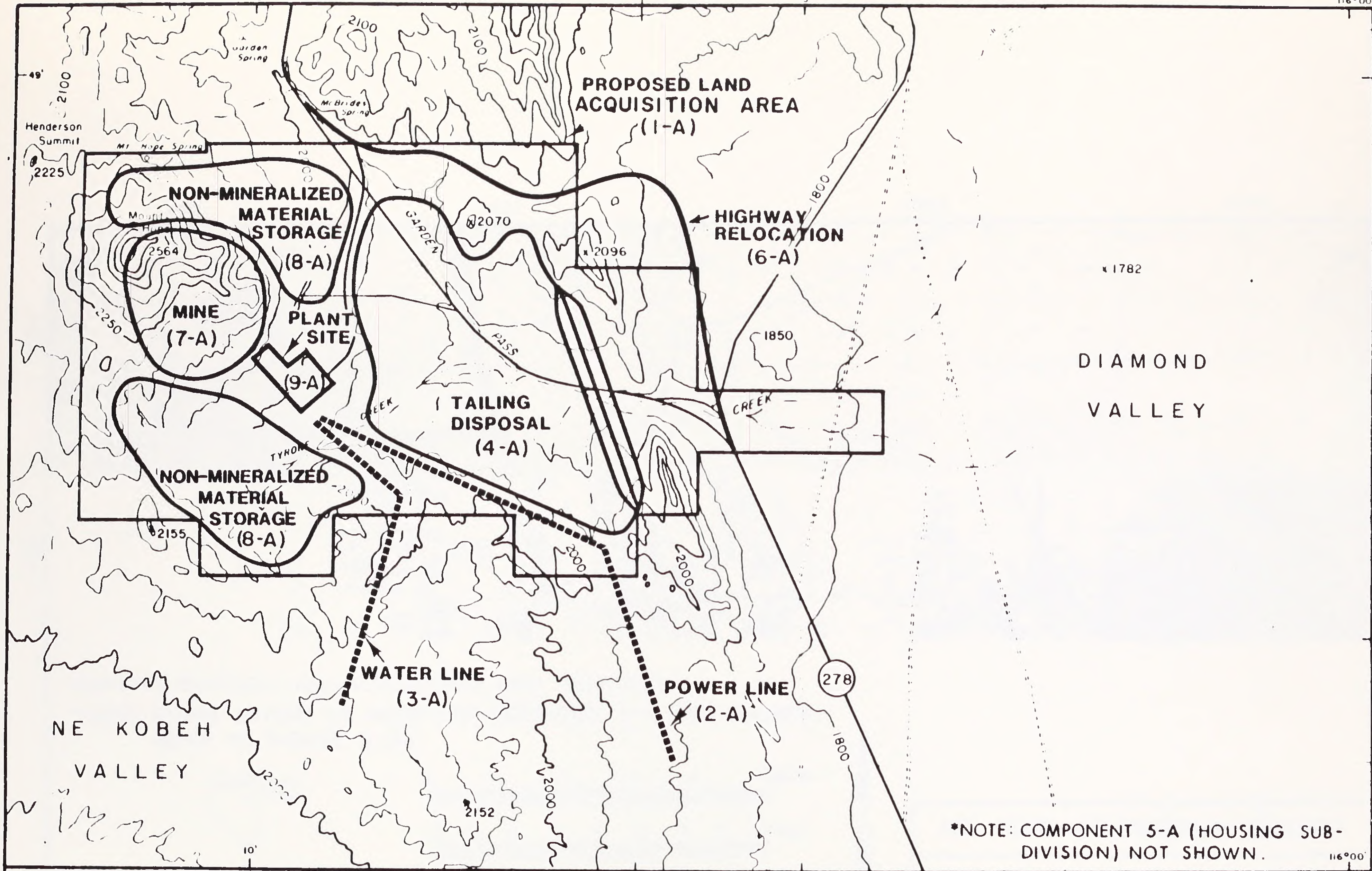
BASE: USGS TOPO QUADRANGLES, GARDEN VALLEY, WHISTLER MTN., DIAMOND SPRINGS & EUREKA, NEVADA.

MT. HOPE MOLYBDENUM PROJECT

REGIONAL STUDY AREA MAP SHOWING PROPOSED ACTION COMPONENTS

U.S. Department of the Interior
Bureau of Land Management

FIGURE 1-3



LEGEND

- EPHEMERAL STREAM
- x 2155 SPOT ELEVATION
- 50 METER CONTOUR
- 250 METER CONTOUR
- STATE ROUTE
- PROPOSED PROJECT AREA BOUNDARY

Nevada MAP AREA

CONTOUR INTERVAL 50 METERS (164 FT)

0 1/2 1 2 MILES

0 1/2 1 2 3 KM

N

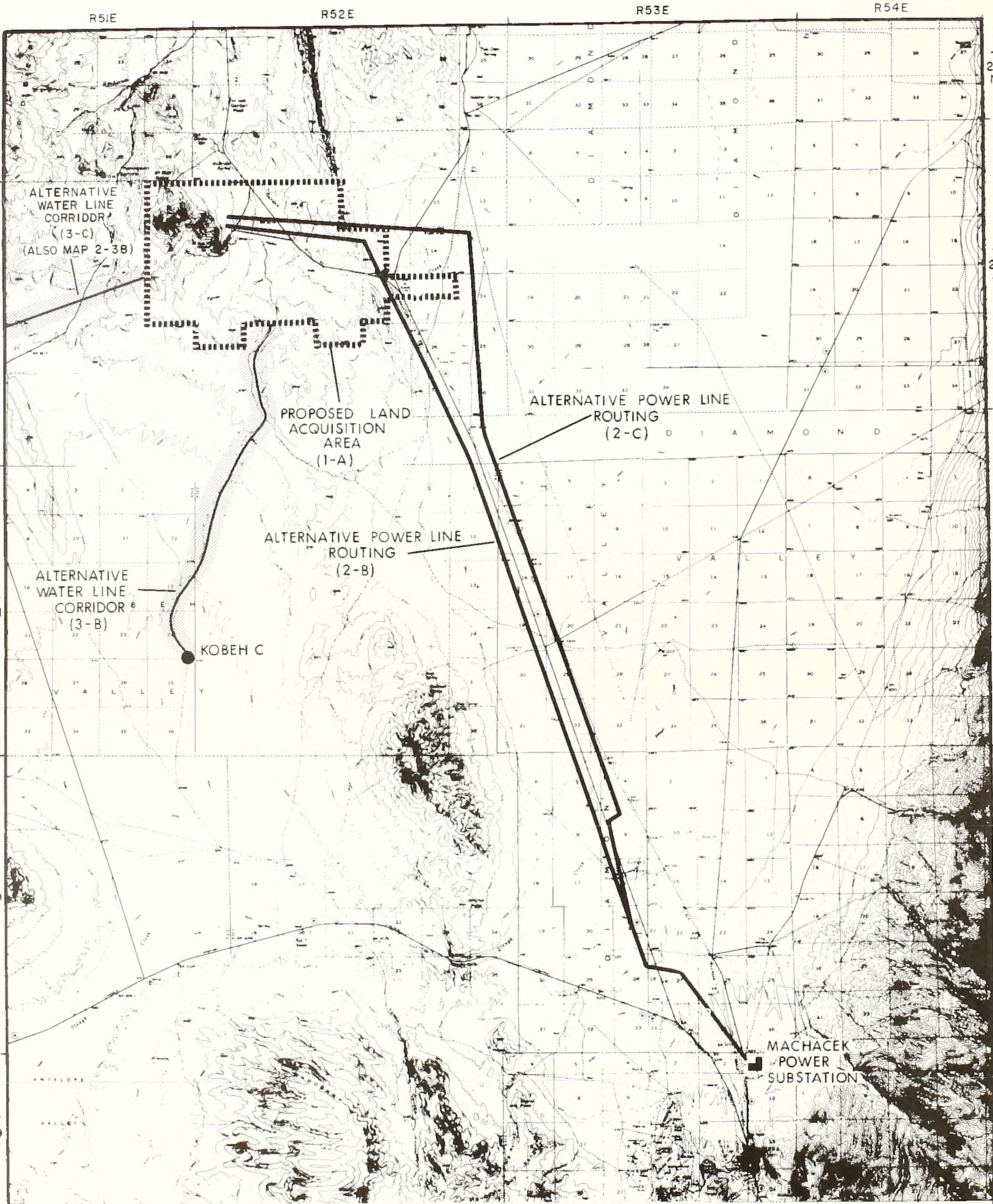
BASE: USGS TOPO QUADRANGLES, GARDEN VALLEY & WHISTLER MTN, NEVADA

MT. HOPE MOLYBDENUM PROJECT

PROPOSED ACTION

U.S. Department of the Interior
Bureau of Land Management

FIGURE 1-4



PROPOSED LAND ACQUISITION AREA BOUNDARY

*NOTE: ENTIRE EXTENT OF WATER LINE CORRIDOR 3-C NOT SHOWN, REFER TO FIGURE 2-3B

Nevada MAP AREA

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Km.

N

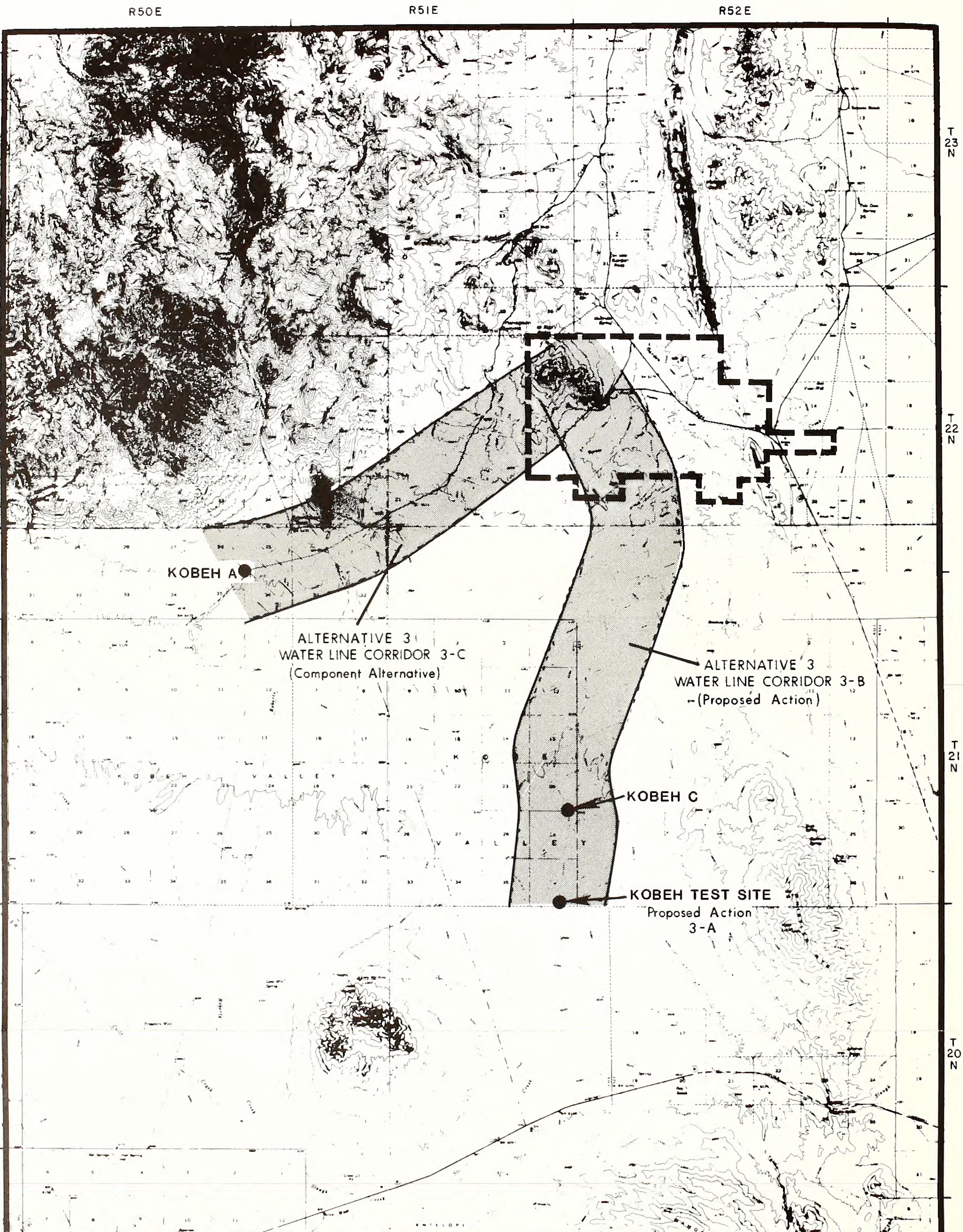
BASE: USGS TOPO QUADRANGLES, GARDEN VALLEY, WHISTLER MTN., DIAMOND SPRINGS & EUREKA, NEVADA.

MT. HOPE MOLYBDENUM PROJECT

REGIONAL STUDY AREA MAP SHOWING ALTERNATIVE COMPONENTS 2 AND 3 TO THE PROPOSED ACTION

U.S. Department of the Interior
Bureau of Land Management

FIGURE 1-5



PROPOSED LAND ACQUISITION AREA BOUNDARY

ALTERNATIVE WATER LINE RIGHT-OF-WAY

Nevada MAP AREA

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Km

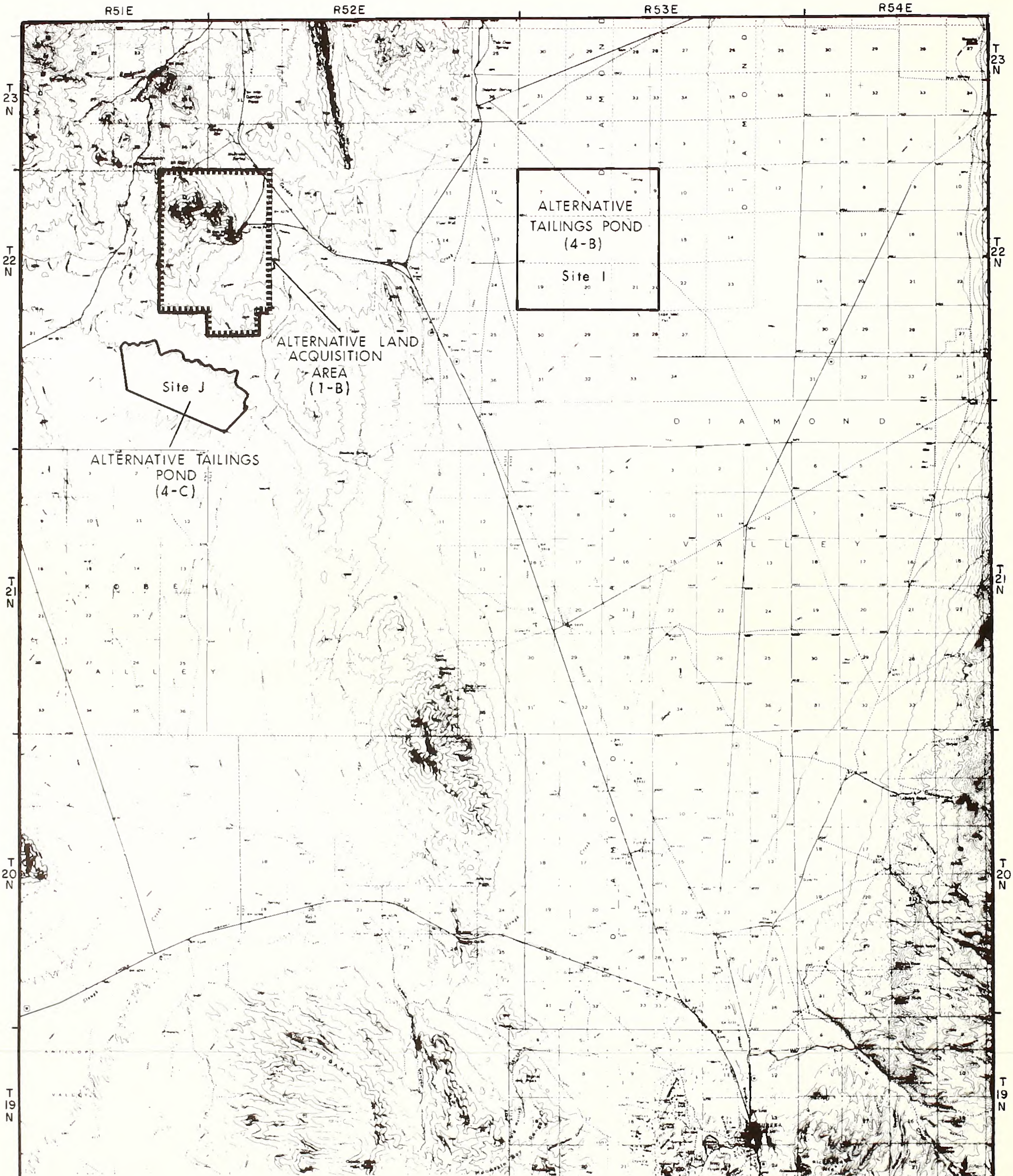
BASE USGS TOPO QUADRANGLES, GARDEN VALLEY, WHISTLER MTN., ROBERTS CREEK MTN. & BARTINE RANCH, NEVADA.

MT. HOPE MOLYBDENUM PROJECT

ALTERNATIVE ROUTING CORRIDORS FOR WATER LINE RIGHT-OF-WAY
(ALTERNATIVE 3 CONTINUED FROM FIGURE 2-3A)

U.S. Department of the Interior
Bureau of Land Management

FIGURE 1-6



ALTERNATIVE LAND ACQUISITION AREA BOUNDARY

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Km.

N

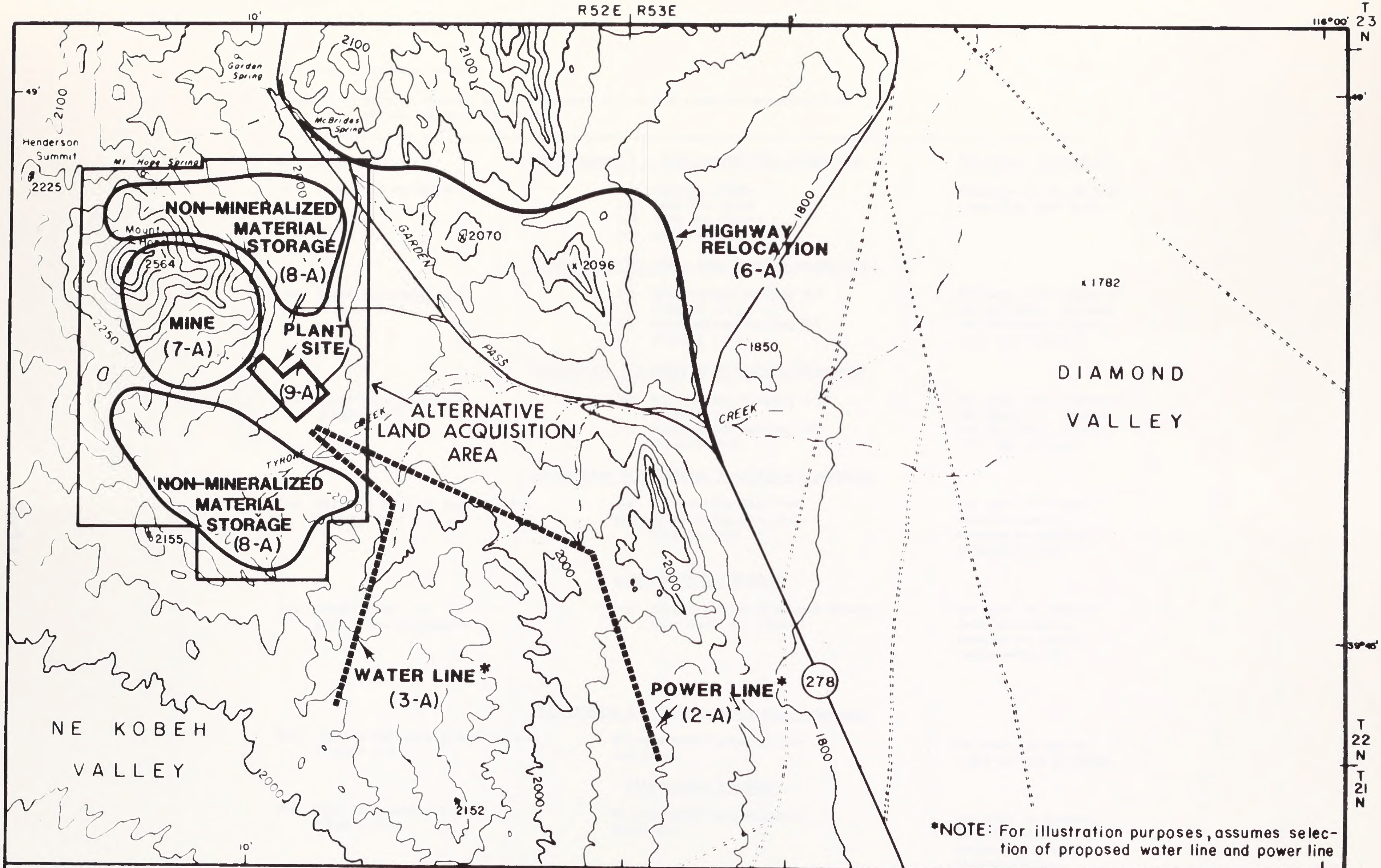
BASE: USGS TOPO QUADRANGLES, GARDEN VALLEY, WHISTLER MTN., DIAMOND SPRINGS & EUREKA, NEVADA.

MT. HOPE MOLYBDENUM PROJECT

REGIONAL STUDY AREA MAP SHOWING ALTERNATIVE COMPONENT 4 TO THE PROPOSED ACTION

U.S. Department of the Interior
Bureau of Land Management

FIGURE 1-7



LEGEND

- EPHEMERAL STREAM
- x 2155 SPOT ELEVATION
- 50 METER CONTOUR
- 250 METER CONTOUR
- STATE ROUTE

Nevada — MAP AREA

CONTOUR INTERVAL 50 METERS (164 FT.)

0 1/2 1 2 MILES

0 1/2 1 2 3 KM

N

BASE: USGS TOPO QUADRANGLES, GARDEN VALLEY & WHISTLER MTN., NEVADA

MT. HOPE MOLYBDENUM PROJECT

ALTERNATIVE LAND ACQUISITION AREA

U.S. Department of the Interior
Bureau of Land Management

FIGURE 1-8

Table 1-1 Summary Details of the Proposed Action and Alternatives Including the No Action Alternative

Proposed Action	Alternative 1 - Land Acquisition Components	No Action Alternative
1-A Land Sale by FLPMA	1-B Mineral Claims 1-C Land Use Lease 1-D Land Use Permit 1-E Land Exchange	Negative or no decision regarding land sale.
	Alternative 2 - Power Line Routing Components	
2-A Power Line Routing A (Figure 1-2)	2-B Alternative Routing 2-B (Figure 1-4) 2-C Alternative Routing 2-C (Figure 1-4)	No power line right-of way granted. Assumes the Mt. Hope Project will not proceed.
	Alternative 3 - Water Line Routing Components	
3-A Water Line Routing A (Figure 1-2)	3-B Alternative Routing 3-B (Figure 1-4) 3-C Alternative Routing 3-C (Figure 1-5)	No water line right-of-way granted. Assumes the Mt. Hope Project will not proceed.
	Alternative 4 - Tailings Pond Sites Components	
4-A Tailings Pond at Location 4-A (Figure 1-3)	4-B Alternative Site 4-B 4-C Alternative Site 4-C (Figure 1-4)	Not part of federal decision-making. Assumes no project implementation.
	Alternative 5 - Housing	
5-A Subdivision (Not shown on figure)	5-B Decentralized Workforce Housing (Not shown on figure)	Not part of federal decision-making. Assumes no project implementation.
	Alternative 6 - Highway Relocation Component	
6-A Highway Relocation Routing 6-A (Figure 1-3)	No reasonable alternatives available	No road relocation right-of-way granted.
	Alternative 7 - Mine	
7-A Mine at Location 7-A (Figure 1-3)	No reasonable alternatives available	Not part of federal decision-making. Assumes no project implementation.
	Alternative 8 - Non-Mineralized Material Storage Areas	
8-A Non-Mineralized Material Storage at Location 8-A (Figure 1-3)	No reasonable alternatives available	Not part of federal decision-making. Assumes no project implementation.
	Alternative 9 - Process Plant	
9-A Process Plant at Location 9-A (Figure 1-3)	No alternatives proposed. (Proposed action is worst-case. See text).	Not part of federal decision-making. Assumes no project implementation.

Report 2, Nevada Department of Conservation and Natural Resources.

3) Henningson, Durham and Richardson (HDR) 1980a. M-X ETR 21, Native Americans, Nevada/Utah

4) ________. 1980b. M-X ETR 20, Land Use.

5) ________. 1980c. M-X ETR 19, Traffic.

6) ________. 1980d. M-X ETR 10, Noise.

7) Hoekenga, Marion P. 1983. A Guide to Eureka: Entertainment, Recreation, Merchants and Services.

8) Mt. Wheeler Power, Inc. 1983. EIR Report, 230 kV Transmission System.

9) Nevada Department of Transportation. 1983. Ward, T. Personal communication, Carson City, Nevada.

10) Nevada Division of Environmental Protection (NDEP). 1983. McCleary, G. Personal communication.

11) Soil Conservation Service (SCS), Archer. 1980. Soil Survey of Diamond Valley Area - Parts of Eureka, Elko and White Pine Counties, Nevada. U.S. Deptartment of Agriculture, Soil Conservation Service and U.S. Department of the Interior, Bureau of Land Management in cooperation with University of Nevada Agricultural Experiment Station.

Data sources specific to analysis of impacts are referenced as appropriate in Chapter 3.0.

1.4 Impact Analyses Methodology

In the event of any discrepancies between this technical report and the EIS, the material presented in the EIS shall supercede that which is presented in this technical report.

1.4.1 Land Use Impact Analysis

Land use character was examined relative to potential for significant impacts upon unique, rare or regulated elements. Additionally the quantitative type of land use changes anticipated were reviewed relative to the potential for regional and local productivity impacts. The proposed action of FLPMA land purchase was reviewed relative to satisfaction of FLPMA criterion of sale.

1.4.2 Transportation Impact Analysis

Analysis of impact potential upon the transportation network involved review of existing ground, rail and air routes. The present availability, condition, usage volume and capacity characteristics of the transportation network were assessed (with emphasis on roadway traffic) in order to determine impact type and significance from future volume/capacity ratios due to project induced roadway trip generation by project component activity and location, peak hour usage periods, increased accident frequency and possible traffic congestion areas.

1.4.3 Noise Impact Analysis

Impacts due to noise emission from the proposed project were ascertained by identifying existing noise levels and sources, noise sensitive receptors, and special terrain features. Major sources of noise related to the construction and operation of the proposed project included impacts associated with blasting, mine haulage and process plant operation, construction activities and traffic flow to and from the site. In addition, several practices are listed for noise mitigation measures which can result in effective reduction of noise impacts.

CHAPTER 2.0

BASELINE LAND USE, TRANSPORTATION AND NOISE DESCRIPTION

2.1 Land Use

2.1.1 Regional Land Ownership

The State of Nevada covers 110,540 square miles (70.7 million acres), making it the seventh largest state in the Nation. The ownership and administration of Nevada land falls under the jurisdiction of several federal, state, local and private entities. The greatest portion of land is under federal jurisdiction.

The State Multiple Use Advisory Committee on Federal Lands ensures that federal management of public land within Nevada is consistent with the State's needs. The committee consists of thirteen members which are appointed by the Governor. Ten members are appointed to represent respectively the Oil, Gas and Mining Board, Central Committee on Nevada State Department of Wildlife, State Conservation Commission, State Environmental Commission, Land Use Planning Advisory Council, State Park Advisory Commission, and Nevada Association of County Commissioners. The remaining three members are appointed to represent interests in each of the following: railroads and utilities; sportsmen; and off-road enthusiasts. The Division of State Lands acts as staff to the Committee. The Committee consults with public and private users of federal lands and advises agencies of the State and the Federal government of the effect of the agency's programs or regulations on the users of federal land (State of Nevada, Biennial Report of Nevada State Agencies, 1982).

Of the 70.7 million acres of land in Nevada, 60.5 million acres (85 percent) are under federal jurisdiction, being divided among the following federal agencies: Bureau of Land Management (BLM), Forest Service, National Parks, Water and Power Resources Service (formerly the Bureau of Reclamation), Fish and Wildlife Service, Indian Reservation and Department of Defense. The BLM administers 48.4 million acres (69 percent) of the total land in the state. Private land ownership comprises the next largest group, holding approximately 10.3 million acres (14.5 percent) of the state.

The remaining land ownership within Nevada is under state, county and local governments and the Bureau of Indian Affairs.

Approximately 82 percent of federal land ownership is under the administration of the BLM. The extent to which the BLM administers land on a county basis ranges from approximately 7 percent in Storey County to as much as 96 percent in Lincoln County. The U.S. Forest Service has land holdings in all but one county in Nevada (Pershing) with a total of approximately 5.1 million acres (8.5 percent of the total federal land).

Private land ownership in Nevada on a county-wide basis ranges from 5 to 20 percent and is characterized by a non-concentrated, wide spatial distribution. This is because most private land ownership in Nevada is used for grazing-type agriculture and is located mainly along drainage areas. Private lands are thus less frequent and occupy the area in a more widely distributed pattern. The remaining private land ownership is mainly concentrated around population centers.

State land ownership in Nevada is quite limited, accounting for merely 133,000 acres (0.18 percent) of the state. Ownership on a county-wide basis ranges from zero acres in some counties to as much as 46,000 acres in Clark County. County owned land, also of limited extent, accounts for approximately 86,000 acres (0.12 percent) of the state. Acreage on a county-wide basis ranges from 300 acres in Nye County to 32,000 acres in Churchill County.

2.1.2 Eureka County Land Ownership

Eureka County encompasses approximately 2.676 million acres of total land, 75 percent of which is administered by the BLM (approximately 2.022 million acres). Most of the county south of the Cortez Mountains (located just north of Pine Valley) is BLM-controlled. North of the Cortez Mountains the BLM land ownership is in a "checkerboard" fashion. Comprehensive planning by the BLM is presently underway for lands administered and includes all types of uses from recreation, fauna management, watershed management, mining, livestock grazing, fire protection, road and trail

construction, cadastral survey and even timber production on the more heavily forested portions of the land.

Because the BLM controlled lands fall under what is termed "multiple use", the land is not restricted merely to domestic grazing but is used for recreation sites and for habitat of wildlife as well.

Additional public ownership in Eureka County includes lands administered by the U.S. Forest Service (165,000 acres; 7 percent), county-owned lands totalling 2,080 acres and 70 acres of recreation/public purpose lands (less than 1/10th of one percent). Indian owned land in Eureka County accounts for 162.1 acres in Pine Valley (Beck, Bureau of Indian Affairs, personal communication, 1984). Other lands presently involving Native Americans are potentially included in Eureka County and are discussed in a following subsection (refer to Section 2.2.1). There are no state owned lands in the county. As evidenced in this discussion, the preponderance of land within the county is controlled by the BLM and U.S. Forest Service. These two federal agencies alone account for 82 percent of Eureka County.

Forest Service land in Eureka County is primarily located in a portion of the Toiyabe National Forest, which lies in the extreme southwestern corner of the county in the Monitor Range and extends in a southerly direction into Nye County.

Private land ownership (commercial, residential, agricultural, railroad) equals 486,194 acres or 18 percent of total county land area (Ihurralde, County Tax Assessors office, personal communication, 1983). A major portion of the private land is used in agricultural production (300,000 acres). Most of the remainder of the private land is owned by the Southern Pacific Land Company (Southern Pacific Railroad offshoot), which constitutes land given to the railroad by the Federal government, as well as land acquired in trades from the BLM and from purchase from private individuals. In the vicinity of Emigrant Pass the company owns practically every other section of land 20 miles north and south of the railroad (Conger, 1974 from Eureka County General Plan).

Additional privately owned land consists of mining operations and the urbanizing areas of the Town of Eureka, Beowawe and Crescent Valley. These three urbanizing areas contain the major number of commercial establishments and public quasi-public buildings. Presently used acreages in the urbanizing areas of Eureka, Cresent Valley and Beowawe are shown in Table 2-1. As noted in Table 2-1, the greater percentage of acreage for the three areas is vacant/open space.

2.2 Land Use Patterns

Present land use patterns in Nevada and Eureka County are principally influenced by ownership of lands and area environmental characteristics which ultimately dictate land capabilities. Land use summary for Nevada is shown in Table 2-2.

Historical land use, especially in the Town of Eureka and Mt. Hope areas has involved mineral resource exploitation since the late 1800's. The first farming in the area was by settlers on widely separated ranches at the mouths of canyons or on the springs along the sides of Diamond Valley. Ranching utilization in Diamond Valley subsequently developed and expanded to include agricultural use in the limited valley areas proximal to naturally available water. Native grass meadows were sustained by runoff water in the lower parts of some canyons and by small streams and springs which were diverted into a system of ditches. This primitive form of irrigation served to distribute the available water and to sustain and increase the size of native grass meadows. Raising livestock has provided a continuing base for the economy of Eureka County for many years. Cattle have been fed principally on the range (usually on public domain via a use permit issued by the BLM), supplemented by native hay from meadows and pastures. Early irrigation well system developments (1949) allowed expanded agricultural use of the Diamond and Kobeh valley floors. By 1964, more than 200 irrigation wells had been drilled and further development of lands within the Desert Land Entry Program of Diamond Valley was closed (refer to Section 2.2.2).

Present land uses within the county include farming, ranching, mining, residential, oil and gas exploration and recreation. A general land use map is presented as Figure 2-1.

Table 2-1 Acreage Breakdown for the Urbanizing Areas of Eureka, Cresent Valley and Beowawe

TOWN OF EUREKA

Land Use Category	Acres	Percent of Total
Residential	30.62	5.9
Commercial	7.77	1.3
Public-Quasi-Public	22.21	4.3
Street Rights-of-Way	44.95	8.6
Open Space	414.45	79.9
Total	520.00	

CRESCENT VALLEY

Land Use Category	Acres	Percent of Total
Residential-Single Family	8.52	1.2
Residential-Trailers	27.25	4.2
Commercial	23.77	3.6
Public-Quasi-Public	6.20	1.0
Street Rights-of-Way	114.00	17.4
Vacant	475.26	72.6
Total	655.00	

BEOWAWE

Land Use Category	Acres	Percent of Total
Residential	1.60	1.6
Commercial	3.32	3.3
Public-Quasi-Public	1.32	1.3
Street Rights-of-Way	30.08	30.1
Railroad Rights-of-Way	31.62	31.6
Vacant	32.06	32.1
Total	100.00	

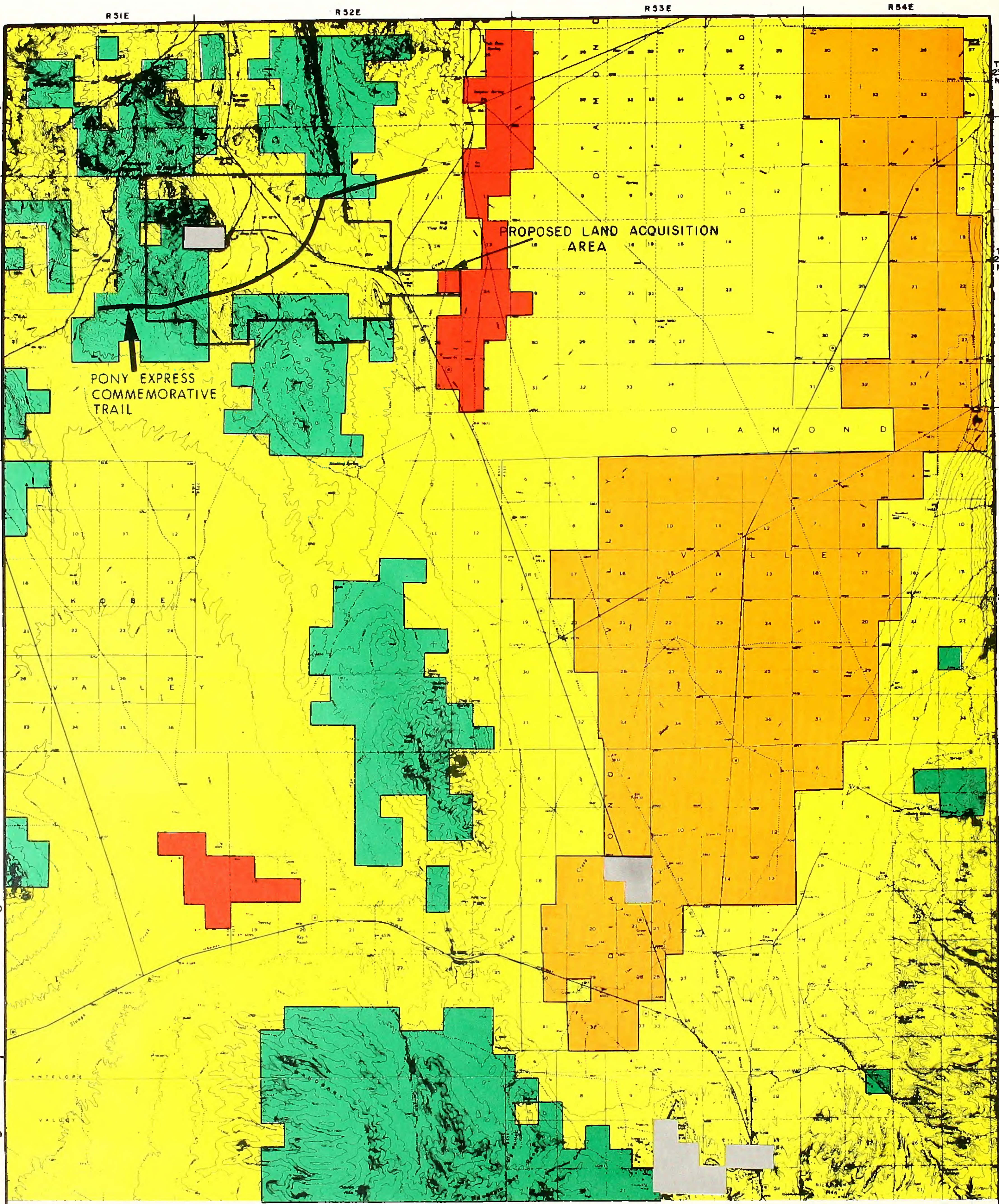
Source: Eureka County General Plan, 1974.

Table 2-2 Land Use Summary, State of Nevada: 1970

Category	Principle Uses	Acres (000's)	% of Total
Urban-Industrial	Cities & Towns, Mines, Roads, Homesites & Military Bases	350	0.5
Cropland	Pasture, Raw Crops, Hay & Grain	954	1.3
Rangeland	Grazing, Recreation, Watershed & Wildlife	53,410	74.0
Woodland	Forest Products, Watershed, Recreation, Wilderness, Wildlife & Grazing	11,745	16.3
Alpine	Watershed, Wildlife, Grazing, Wilderness & Recreation	30	1/
Phreatophytes	Pasture and Wildlife	2,959	4.1
Water	Lakes, Rivers, Irrigation Water, Recreation & Wildlife	1,059	1.5
Playa	Bombing, Gunnery Range, Weapons Testing, & Recreation	1,661	2.3
STATE		72,168 1/	100.0

1/ Portions in the State of California.

Source: Nevada Department of Conservation and Natural Resources, Division of Water Resources, Open File Resource Abstract, Nevada State Water Plan, 1974.



PROPOSED LAND ACQUISITION AREA BOUNDARY

MOUNTAIN FOREST AND BRUSHLANDS

DESERT BRUSH AND SHRUBLANDS

SCRUBLANDS

AGRICULTURAL LANDS

PRESENT HUMAN USE / OCCUPIED LANDS (e.g. EUREKA TOWN)

BASE: USGS TOPO QUADRANGLES, GARDEN VALLEY, WHISTLER MTN, DIAMOND SPRINGS & EUREKA, NEVADA.

Nevada MAP AREA

N

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Km.

MT. HOPE MOLYBDENUM PROJECT

EXISTING LAND USE PATTERNS

U.S. Department of the Interior
Bureau of Land Management

FIGURE 2-1

The majority of land use controls in Eureka County are those established by the BLM in its administration of public lands. Primary land use goals and proposed controls are based on specific criteria developed as part of the Shoshone-Eureka Resource Management Plan presently under review. Land use controls established by local government are currently limited to an adopted land division ordinance. The county has not established a zoning ordinance or building codes. A County General Plan prepared under contract with the Nevada Urban Planning Division and the Eureka County Commissioners in 1974 and amended in 1982, serves as a primary land use guide.

As set forth in the Eureka County General Plan, future urbanizing areas and urban type subdivision of land should be restricted in and around the Town of Eureka, Crescent Valley and Beowawe. Further growth in Eureka should be to the north, in the high bajada portion of southern Diamond Valley. Any urban development to the south of Eureka poses possible disturbance to the Town's water supply, in addition to complications associated with steep slopes and faults. Growth for Beowawe should be to the south, in order to avoid the flood plain of the Humboldt River. For Crescent Valley, further growth should proceed in a northerly direction but within a specific soil type boundary which is suitable for septic tank filter fields.

Three particular areas in Eureka County have been recommended in the Land Use Plan (County General Plan) as permanent "open space". "Open space" is generally mountainous terrain and/or in which land capabilites are not suitable for agriculture or urban type development. The permanent "open space" areas are the Diamond Valley Alkali Flat, Toiyabe National Forest and the flood plain of the Humboldt River. Descriptions of each are from the County General Plan (1974) as follows:

> "The Diamond Valley Alkali flat is not suitable for either agricultural purposes or for urban development. It is therefore recommended to be maintained in permanent open space, with some limited extractive industries allowed.
>
> The Toiyabe National Forest, in the Monitor Range, lies in a largely unspoiled natural condition primarily because it

is isolated and because it lies in extremely rugged terrain. It should therefore be kept in permanent open space.

The Flood Plain of the Humboldt River is, like the Diamond Valley Alkalai Flat, unsuitable for urban development. However, by good management techniques it could be used for agriculture. The use of agriculture and/or recreational pursuits is suitable in terms of maintaining the flood plain in permanent open space. The flood plain should never have buildings constructed upon it."

The land capabilities and existing land use for Mt. Hope and surrounding areas is that of open space-mountain terrain. The Land Use Plan (County General Plan) has recommended two general land use types based upon land capabilities for the Mt. Hope area. The two land use types have been abstracted from that report and appear as follows:

1) Open Space and Appropriate Associated Uses. The land use category of "Open Space and appropriate associated uses" is recommended for the portions of the County in generally mountainous terrain. Appropriate uses of the land are: recreational use, mining, limited grazing, and watershed protection measures. No buildings should ever be constructed in these parts of the County.

2) Agriculture; Mining; Very Limited Housing. This recommendation for the land use plan is based upon the existing fact that much of the area is already devoted to agricultural pursuits. Mining would also be appropriate, if certain minerals were to be located to be mined. Generally, existing farm houses should be "grandfathered in"; however, any new housing should be extremely limited since none of the soils in these areas is suitable for septic tank filter fields.

As can be seen, the environmental factors of soils, topography, hydrology etc. characteristic of Eureka County and the Mt. Hope area

significantly affect most categories of land resource utilization potential. Relative to regional (five county area) and state agricultural/ranching values, Diamond and Kobeh valleys represent areas of comparatively high utilization benefit. Limited water availability, climatic and topographic conditions, however, limit total land commitment to agriculture. Population distribution (e.g. residential, commercial) is primarily a reflection of economic influences (e.g. agriculture/ranching and local dependency on mine siting).

The following subsections present Eureka County and Mt. Hope area land use patterns with respect to Native Americans, agricultural, grazing, mining/mineral exploration, recreation and visual resources.

2.2.1 Native Americans

The American Indian Religious Freedom Act provides for the preservation and protection of sacred places, animals, plants and artifacts. It also ensures freedom of access to these by Native Americans. Sacred places are usually prominent surface features often associated with creation legends and mystic times. Common sacred sites are caves, trails, certain mountain peaks, unusual rocks or rock outcroppings, lakes, springs and burial or cremation sites.

The Historic Preservation Act calls upon government agencies to pursue actively the preservation of significant historic sites, archaeological sites and culturally important locations. The Advisory Council on Historic Preservation encourages the participation of relevant, federally recognized tribes during the evaluation of cultural resource signficance and the development of impact management alternatives.

Indian lands in Eureka County total 162.1 acres in the Pine Valley area. The land is composed of seven allotments and is held in trust (allotment No. N-1709). The land is located in Sections 4 and 5 of Township 26N, Range 49E; present land use is for farming (Beck, personal communication, 1984). There are no reservation lands near the project area; however, the region in which Mt. Hope is located was once occupied by the Western Shoshone (Technical

Report No.7). Several Shoshone Reserves and Colonies are located in surrounding counties; their descriptions and land use characteristics are given below and have been abstracted from Henningson, Durham and Richardson (HDR, 1980a).

Te-Moak Western Shoshone. Members of several reservations and colonies in north-central Nevada claim direct descent from the Shoshone bands allied under Te-Moak, the Shoshone chief who signed a peace treaty with the United States in 1863. This tribal identify is underscored by the Te-Moak Western Shoshone Council, a governing body of six persons which has total jurisdiction over all matters concerning lands of member reserves. Te-Moak Shoshones consist of the following:

Battle Mountain Colony. (Lander County) This Colony, located near the junction of the Humboldt and Reese rivers, consists of 683 tribally owned acres (273 ha) purchased for the Shoshone in 1917. Battle Mountain band members claim direct descent from Shoshones allied under Chief Te-Moak. The six-member Battle Mountain Community Committee has jurisdiction over local affairs other than land. The Colony has a total of 175 members (Facilitators, 1980), 117 of whom live within the colony and the majority of whom speak the Shoshone language. Battle Mountain reserve lands have no potential for irrigation, contain no known minerals, and seem to offer little potential for development although plans exist to develop an R.V. park.

Elko Colony. (Elko County) This reserve consists of 193 tribally owned acres (77 ha) located near the town of Elko, Nevada. The majority of its 440 members speak Shoshone, and take considerable pride in their heritage. The Elko Colony was instrumental in the creation of the Te-Moak Council, which is headquartered at Elko. The seven-member Elko Community Committee controls local affairs other than land issues. None of the Colony lands is irrigable, and there are no current plans for economic development.

South Fork Reservation. (Elko County) Located 30 mi (48 km) south of Elko, this reserve consists of 13,050 tribally owned acres (5,220 ha). It was created specifically for the use of Te-Moak bands of Western Shoshone by the purchase of 9,000 acres (3,600 ha) in 1938-1939, and subsequent additions through 1941. The number of residents at South Fork is 98 (Facilitators, 1980). The majority of members speak Shoshone. The South Fork Reservation is active in the Te-Moak Council and participated in its creation. Local affairs other than land matters are coordinated by the seven-member South Fork Community Council. The Reservation has a potential irrigable land area of 3,763 acres (1,505 ha), only a small portion of which has been realized. The Te-Moak Council has placed high priorty on the development of irrigation and range improvements at South Fork.

Odger's Ranch. (Elko County) Odger's Ranch is a parcel of 1,987 tribally owned acres of (795 ha) located 150 mi (240 km) southeast of Elko. This reseve, which has 7 permanent residents (Facilitators, 1980), is under the jurisdiction of the Te-Moak Council. The development of irrigable land, estimated at 317 acres (127 ha), and the improvement of rangelands are listed as major priorities. Odger's Ranch includes an additional 40,000 acres (16,000 ha) in BLM permits.

Ruby Valley Reservation. (Elko County) The Ruby Valley reserve is located southeast of Elko, nearly midway between South Fork Reservation and Odger's Ranch. It consists of 120 acres (48 ha) which were allotted to individual Shoshones under the Allotment Act of 1887. The allotment was conveyed to the allottee in 1970 by a trust patent. Population figures for Ruby Valley are unavailable in the 1978 BIA statistics. A 1972 BIA estimate cited by the U.S. Department of Commerce (1974:326) indicated 40 persons in residence.

In addition to the Te-Moak Shoshone reserves, three other Shoshone federal reserve areas are found in central Nevada:

Ely Colony. (White Pine County) Ely Colony, located at Ely, was established in 1931 for local Shoshone Indians who had no tribal rights on any other reservation. It consists of 93 tribally owned acres (37.2 ha), with an additional 10 acres (4 ha) leased from the County. Some 74 Indians reside on the reserve, and an additional 117 live in the Ely area (Facilitators, 1980). Some traditional crafts persist. The Colony is governed by the five-member Ely Colony Council. This small reserve is strictly residential, and has no potential for irrigation but plans exist for the development of a full service truck stop.

Yomba Reservation. (Lander County) Yomba Reservation is located in central Nevada approximately 180 mi (290 km) east of Carson City. It was created in 1937 for the descendants of Shoshone Indians living at the headwaters of the Reese River who refused to relocate after the Anglo-Indian peace treaty of 1863. The 4,718 tribally owned acres (1,887 ha) which make up the reserve consist of several old ranches which are interspersed with non-Indian ranches. The Yomba Reservation has 102 members (Facilitators, 1980). Local affairs are coordinated by the seven-member Yomba Tribal Council. Reservation lands are watered by a dam constructed by the BIA. Some 2,044 acres (818 ha) are under irrigation, and support a ranching economy. In addition to reservation lands, the Yomba Reservation Indians hold 268,397 acres in BLM grazing permits.

Duckwater Reservation. (Nye County) Duckwater Reservation is located in central Nevada 70 mi (112 km) southwest of Ely. The Duckwater area was settled by Anglo-Americans in 1868. Most Shoshones native to this region moved to the Duck Valley Reservation in northern Nevada after its establishment in 1877. The descendants of those who refused to relocate were ultimately granted a 3,815-acre (1,526 ha) tribally owned reserve in the Duckwater area. The Reservation has 124 resident members (Facilitators, 1980), and is governed by the six-member Duckwater Tribal Council. Duckwater Reservation lands contain 930 irrigable acres (372 ha), but no electrical power is available and all facilities for water are individually owned. The reserve contains no known minerals, and has little potential for intensive economic development.

Steady employment is a high priority concern of Shoshone members. In addition to Reservation lands, the Duckwater Indians claim to hold up to 800,000 acres (320,000 ha) in BLM permits (BLM estimates 352,000 acres) and have applied for its withdrawal.

In order to ensure an opportunity for the early identification of potential Native American concerns with regard to the Mt. Hope project, Intermountain Research initiated contact with various Indian groups in Nevada in February and March, 1983. Letters introducing the proposed Mt. Hope project were sent to the Inter-Tribal Council of Nevada, the Paiute Shoshone Tribe of Fallon, the Duckwater Shoshone Tribe, the Yomba Shoshone Tribe and the Battle Mountain Colony (Te-Moak Bands of Western Shoshone). Comments and suggestions with regard to contemporary Indian land use and concerns were solicited.

One response was received; the Duckwater Shoshone Tribe wrote to present the information that the Western Shoshone and the United States are presently in litigation with regard to the disposition of the land in the project area (as well as other lands). Copies of correspondence relating to Native American consultants appear in Appendix 8-A of this technical report.

2.2.2 Agricultural Lands

Agriculture has historically played a dominant role in the economy of Eureka County, as it has for most rural counties. Many areas in Nevada were settled for farming potential as much as for mining/mineral exploration. A majority of farmland in Nevada is pasture and rangeland, emphasizing that livestock production (particularly beef and sheep) is the major agricultural land use. While ranching operations serve as the mainstay of agricultural activity, cropland agriculture is performed wherever water is available and shares a strong relationship with ranching. This is because hay, the largest crop in both acreage and dollar value, is consumed locally by the livestock industry. As the most prevalent crop, alfalfa hay and wild hay comprised 83 percent of the harvested acres in Nevada and contributed 60 percent of the market value of crop production output in 1977 (HDR, 1980b).

Recent national trends in farming from the 1940's to 1974 were also reflected in Nevada, that being a steady decline in the number of farms and an increase in the average farm size. A dramatic reversal of this trend occurred in Nevada during the period 1974 to 1978 when the number of farms increased from 2,076 to 2,877 (38.6 percent increase). The average size of a farm during the same period decreased from 5,209 acres to 3,641 acres (31 percent decrease). This reversal in trend was also evidenced in Eureka County when the number of farms increased from 62 to 83 (33.9 percent increase, 1974-1978); the average size of a farm decreased from 4,281 acres to 3,597 acres (16 percent decrease).

Recent studies by HDR (1980b) have revealed that "two distinct types of farming operations have been observed as characteristic of Nevada. First is the part-time farmer who lives on farmland, and runs a few cattle or plants a small crop, while keeping another job nearby or commuting to an urban area for employment. Second, and more important in terms of output, are the full-time farm and livestock operations which are very large, including large amounts of equipment, land, federal leasing privileges, and hired help. Incomes, where crop production is a large share of agricultural output, show the greatest stability, while counties most dependent on cattle show the greatest variation and instability. Many farmers with small operations find they must work off the farm to support their families and ranch operations. Statistics for 1974 report that just over half (54 percent) of the farmers reported working off-farm. Lander, Eureka, Lincoln, and Nye counites show negative net proprietors' income for 1974 to 1976, thus providing a strong inducement to augment their income from another job source (Department of the Interior, May 1979)".

Eureka County has one of the largest farming districts in the state, located on Desert Land Entries in Diamond Valley. Because of the arid environment, almost all of the harvested cropland is on irrigated land, provided by the pumping of groundwater from over 200 wells in Diamond Valley. The condition of limited land suitable for cropland, which, when combined with the scarcity of water for irrigation, has created an historical pattern of land ownership in the region. Through the Desert Land Entry Program, those lands which have water access have been patented and withdrawn from the BLM adminis-

tration (conveyed to private ownership). A more detailed description of the Desert Land Entry Program is provided by HDR (1980b) as follows:

"In cases where soil suitable for crop production exists and where water can be developed for irrigation, public land can be removed from federal administration and can be conveyed to private ownership under the Desert Land Entry Program (DLE) of 1877. Because of the typically low productivity of desert lands and high expense of developing systems of irrigation, the Homestead Act providing 160 acres (64 ha) of land to aspiring farmers was felt to be inadequate for supporting a profitable operation. The 1877 Desert Land Entry Act provided procedures for an individual to receive 640 acres (256 ha) for $1.25/acre to be improved through irrigation. Amendments later reduced the acres to 320 acres (128 ha) for an individual (640 acres (256 ha) for a family), and contained specific requirements for irrigation. (One eighth of the entry is to be cultivated and irrigated to produce profitable results. A DLE claimant has four years to show proof of the reclamation, i.e., cultivation and improvements of the land to qualify for patent title.) Between 1877 and 1976, 1,687 applications have been patented on 376,338 acres (150,535 ha) in the State of Nevada (Department of the Interior, 1979). The most active period of interest occurred from WW II to 1964 when 758 patents for 187,371 acres (74,948 ha) were recorded. The scarcity of water for developing irrigation sources has severely limited the utilization of this program in Nevada. In fact, due to concern over appropriating scarce water in some valleys, the program was terminated in Nevada on June 4, 1964 by the Secretary of the Interior, to provide time for assessment of water availability and agricultural potential of the valleys.

The moratorium on Desert Land Entries was lifted January 1, 1979. Over 8,000 inquiries and 1,745 applications were received during the initial 90-day filing period. An analysis of the economics of farming new Desert Land Entries in Nevada was recently completed by the BLM Nevada State office. Their findings suggest that the current level of agricultural prices, land preparation costs, the costs of developing wells, purchasing irrigation equipment, and expending energy to irrigate is so high that only under assumptions of above average crop yields for potatoes, or alfalfa seed does it appear profitable to even attempt a Desert Land Entry application. The

major problem facing new DLE applicants is the lack of unallocated water in most of the areas where applications were entered. In as much as processing Desert Land Entry applications is an unbudgeted item (hence a low priority item) for the Nevada BLM, it is estimated that it will be years before any of the current applications will be allocated for farming."

The development of the "new lands" in Diamond Valley via the DLE began in 1949 and continued until the area was closed to additional development in 1964.

Because of the significance of agriculture in Eureka County, land use for agricultural purposes is encouraged and the county has adopted planning and zoning ordinances which protect agricultural land from urban development. Agricultural income and earnings accounted for 8.9 percent of the total county income in 1978. Market value of agricultural products sold in Eureka County in 1978 amounted to approximately $7.7 million; $2.7 million in crops and $5.0 million in livestock (65 percent of total).

In 1980 a total of 44,000 acres of hay produced 60,400 tons (average yield tons/acre equalled 2.16). Of this total, 16,000 acres produced 44,800 tons of alfalfa hay (average yield tons/acre equalled 2.80) and 1,200 acres produced 15,600 tons of other hays (average yield tons/acre equalled 1.30).

Major agricultural land use, in terms of total acreage, is ranching. Some of the ranches in the county are quite extensive, the largest of which are located to the north and northeast of Dunphy (northern Eureka County) in the Boulder Flat area and in the Tuscarora Mountains. Other areas of extensive ranching are located at Crescent Valley and Pine Valley. Cattle/calf production in 1981 amounted to 40,000 head at an average value/head of $405.00 ($16.2 million total value).

Due to the localized availability of water, cropland and irrigated agriculture are located in very specific areas within Eureka County. Much of the cropland is found in the southern part of the county near the Town of Eureka and in the northern part of the county along the Humboldt River floodplain. Much of the agricultural land in the portion of Diamond Valley

just north of Eureka (DLE) is in a solid block of private ownerships. The largest single area of cultivated and pasture land in the county is in the upper portion of Diamond Valley, covering a distance of approximately 18 miles. Other private agricultural holdings are found in lower Diamond Valley, concentrated along the base of the western foothills of the Diamond Range and east of the southern portion of the Sulphur Springs Range. Additional scattered agricultural lands occur at Henderson Creek, Pine Valley, Fish Creek Valley, Antelope Valley, Monitor Valley, Bean Flat, Whirlwind Valley, Beowawe-Dunphy and on either side of the Diamond Valley Alkali Flat.

Various agricultural land use techniques have been used in Eureka County, such as the planting of crested wheatgrass, selective burning, chaining and brush-flooding. Brush-flooding involves the use of water to flood brushlands during the winter, thereby allowing the water to freeze and kill the brush. This also helps to leach the soil of salts. Both processes combined increase the acreage of meadow or pastureland (Eakin, 1961). A description of the other techniques was provided in the Eureka County General Plan (1974) and is given below:

"The planting of crested wheat in recent years had proven both a blessing and a detriment to Eureka County. Whereas crested wheat is very beneficial to cattle and big game wildlife, it has had adverse effects upon small game birds because of the removal of vegetation important to them. However, recent planting of crested wheat have also included alfalfa, clovers, and various forbs in an effort not to remove important game birds. It is not presently known exactly how successful such efforts have been.

Approximately 87,000 acres (136 square miles) have been planted in crested wheat in Eureka County. Such plantings have been effected by both the Battle Mountain and Elko districts of the BLM.

Recent experiments by the Forest Service indicate that selective burning during the spring months removes the undesirable big sagebrush, paving the way for desirable plants such as bitterbrush and perennial grasses to gain a stronger foothold. It is demonstrated that, following the selective burning, regrowth from browse plants shows remarkable vitality and

a significantly higher protein content. These are important factors for both livestock and wildlife utilizing range areas for grazing.

In many areas of the West, pinyon-juniper woodlands are considered poor range land for both domestic livestock and big game. Pulling anchor chains or strong cables behind dual caterpillar tractors has provided a means of removing the older brittle trees of both pinyon and juniper so that more desirable plants such as grasses and bitterbrush could take hold. One area in Eureka County has been chained. The pinyon-juniper were removed and replaced with crested wheat, squawbrush, bitterbrush, and chokecherry".

Agricultural areas in the Mt. Hope region are restricted to Diamond and Kobeh Valleys. Although proposed power line and pipeline routings will cross in part such lands, the primary mine/process plant site area does not include cropland areas. The main crop produced is alfalfa (88 percent of Diamond Valley cropland acreage); the secondary crop is small grain.

Acreage in production for Diamond Valley in 1981 totalled approximately 35,000 acres (30,740 in alfalfa, 4,000 in grain and 260 in pasture). The majority of cropland acreage required irrigation, (in excess of 70,300 acre-feet per year in Diamond Valley; 3,240 acre-feet in Kobeh Valley). The most widely used method of irrigation in Diamond Valley is sprinkling, primarily lateral and mainline and self-propelled rotary systems (SCS, 1980). Average yields per acre in Diamond Valley for alfalfa and grain equalled 4.0 and 1.5 tons per acre, respectively in 1981. It is projected that in year 2000, Diamond Valley, Antelope Valley (Eureka and Nye County) and Kobeh Valley irrigated croplands will total 37,000 acres, 500 acres and 1,800 acres, respectively (Desert Research Institute, 1980).

2.2.3 Grazing Lands

Livestock grazing dominates agriculture endeavors and is the most prevalent land use pattern on both private land and BLM administered land in Nevada. Rangeland is primarily used for domestic livestock grazing, and wild herbivore forage. Rangeland is not restricted to one specific description, but is generally very heterogeneous with widely diverse types of soils and

vegetation, allowing for different range types such as prairies, shrublands, savannas and natural wet meadows.

The most pronounced characteristic of rangeland is that it is land on which the climax, or natural potential, plant community is dominated by grasses, grasslike plants, forbs, and shrubs. It is also seldom, if ever, in a stable condition, regardless of grazing. Proper management of rangeland also provides wildlife habitat, recreation, watershed, groundwater recharge, historic and cultural sites, natural areas, beauty, clean air and water (SCS, 1980).

Rangeland makes up approximately 50 percent of the land surface of the earth and over 40 percent of the continental Unites States. In the eleven western states alone, 48 percent of the total land area is federally owned of which 73 percent of this area is grazed (HDR, 1980b). The Council for Agricultural Science and Technology (1974) has determined that in addition to significant portions of private land being grazed, federal land provides about 75 percent of the forage required by beef cattle and about 90 percent of the forage required by sheep. The average acre of federally managed rangeland currently produces around 100 pounds of air dry forage (HDR, 1980b). Even with this low production figure, grazing is still the most economically productive use for much of this area (Clawson, 1972).

Rangeland is quite susceptible to the effects of change, whether man-made or natural (e.g., soil disturbance, drought, flood, freezing, fire or overgrazing), due to certain limits to the grazing pressure that rangeland vegetation and soil can tolerate. Overgrazing, the use by too many animals for too long and at the wrong seasons of the year, has been a major problem in the western states. Between 1865 and 1934, severe overgrazing caused major changes in plant species presence and in relative composition, and has generally reduced productivity and decreased livestock carrying capacity of many rangelands (Stoddard, Smith and Box, 1975; Young et al., 1976). After a half century of uncontrolled use, United States grazing lands had lost over half of their forage productivity (Lieurance, 1979). It was not until 1934 that passage of the Taylor Grazing Act brought about the regulation of live-

stock grazing on federal lands. Range management and regulation is administered by the Bureau of Land Management (BLM).

Approximately 79 percent of Nevada is grazed, of which most operations utilize the plentiful BLM-owned lands for open range grazing. The two main types of livestock operations in Nevada are the cow-calf and the ewe-lamb, described as follows (HDR 1980b):

> "A cow-calf operation consists of a base herd of bulls and cows that produce a calf crop each year. A few of the heifer calves are kept to rotate the breeding cow herd. Most of the calf crop and the non-productive or old cows and bulls are marketed. Market size for calves is usually between six and fourteen months of age. Ewe-lamb operations function similarly but the animals are usually on the range for a greater portion of their preparation for slaughter".

Cattle and sheep ranchers are located on private land and graze their herds via permit on nearby BLM and Forest Service lands. HDR (1980b) states that:

> "Large operators located in a given community will often have cattle or sheep grazing leases on holdings in a number of different planning units. The individual grazing allotments within each district operate under controlled time periods generally designed to increase forage quality and quantity as well as to meet multiple-use requirements imposed by other constituencies such as mining, recreation, wildlife or environmental protection interests".

Livestock operators who use lands administered by the BLM or Forest Service for grazing purposes pay a fee. In Nevada the fee was $1.40 per animal unit month (AUM), $0.46 less than in 1982. An AUM is the forage required to support one mature cow, one horse or five sheep for one month. Each AUM of grazing capacity is equivalent to about an average of 28.6 pounds of meat for cattle and 23.3 pounds of meat or 4.3 pounds of wool for sheep (Council for Agricultural Science and Technology, 1974) but will clearly vary by season, type of livestock, and quality of forage available.

Grazing fees, according to the U.S. Department of Agriculture, Forest Service, are determined by a formula established in the Rangeland Improvement Act of 1978. The formula, which is being used on a seven-year trial basis, considers rates for leasing private grazing lands, the difference between total costs of grazing on public and private lands, beef cattle prices and the costs of producing livestock. (Eureka Sentinel, 1983).

The Federal Land Bank in Reno established one AUM as having a value of about $50.00 (Falk, 1980; from Final Shoshone-Eureka Resource Management Plan and Environmental Impact Statement). The market value of AUMs is used as a credit and capital structure for area ranchers. In recent years, several Environmental Impact Statements (EIS) have been required of the BLM in relation to BLM planning units. Quoting from HDR (1980b),

> "As a result of the EIS studies for grazing the BLM has been required to produce, cutbacks of up to two-thirds or more on many allotments are programmed for the near future. If implemented, these cutbacks will significantly reduce the short-term livestock production in these states. Over the long term, however, livestock use of BLM lands is projected to increase by up to 30 percent. Much of this increased grazing capacity would come from improved rangeland, those areas where treatment has resulted in more productive vegetation."

Eureka County ranchers use rangeland on BLM lands quite extensively. Rangeland is also extensive throughout the Mt. Hope region (refer back to Figure 2-1, Section 2.2) and occurs as mountain forest and brushlands, desert brush and shrublands and scrublands. The Battle Mountain District BLM is responsible for administering the lands in the Mt. Hope region and characterized management levels by planning units and individual allotments containing animal unit months. Numerical establishment of AUMs available in each allotment were based on an occular range survey in 1964. The actual number of AUMs available will fluctuate on a yearly basis due to climate variations. Table 2-3 lists total AUMs and concentrations (acres/AUM) for selected valleys in Eureka County (1979). Diamond Valley had a total of 28,250 AUMs (acres/AUM equalled 16.4) and Kobeh Valley had a total of 33,510 AUMs (acres/AUM equalled 14.9).

Table 2-3 Total AUMs and Concentration (acres/AUM) for Selected Valleys in Eureka County (1979)

Location	Total AUMs	AUM Concentration
Diamond Valley	28,250	16.4
Kobeh Valley	33,510	14.9
Pine Valley	39,530	16.4
Crescent Valley	31,570	15.7
Antelope Valley	11,980	19.5

Source: HDR, 1980b.

Range sites are areas of range where climate, soil and relief are sufficiently uniform to produce a distinct kind of climax vegetation. Diamond Valley has ten range sites, two of which (NV 28-21 and NV 28-29) are the dominant range sites within the proposed project boundary. A discussion of range sites, range condition classes and the two specific range sites in the Mt. Hope area is provided next and has been abstracted from the Soil Survey of Diamond Valley Area (SCS, 1980). A description of all ten range sites is provided in Appendix 8-C of this report.

> "Soils that have the capacity to produce the same kinds, amounts and proportions of range plants are grouped into range sites. A range site is the product of all environmental factors responsible for its development.
>
> A plant community existing within a range site that has not undergone abnormal disturbance is the potential, or climax, plant community, for that site. Climax plant communities are not precise or fixed in their composition but vary, within reasonable limits, from year to year and from place to place.
>
> Abnormal disturbance such as overuse by livestock, excessive burning, erosion, or plowing results in changes in the climax plant community or even complete destruction if disturbance is drastic enough. Then the range site has not deteriorated significantly under such disturbance, secondary plant succession progresses in the direction of the natural potential, or climax, plant community for the site.
>
> Four range condition classes are used to indicate the degree of departure from the potential, or climax, vegetation brought about by grazing or other uses. The classes show the present condition of the native vegetation on a range site in relation to the native vegetation that could grow there.
>
> A range is in excellent condition if 76 to 100 percent of the vegetation is of the same kind as that in the climax stand.

It is in good condition if 51 to 75 percent; in fair condition if 26 to 50 percent; and in poor condition if less than 25 percent.

When changes occur in the climax plant community because of use by livestock or disturbance, some plant species will increase and others will decrease. Which species increase or decrease depends on the grazing animal, season of use, and the degree of use. By comparing the composition of the present plant community to the potential plant community, it is possible to see how individual species have increased while others decreased. Plants not present in the climax community, which show up in the present plant community, are invaders for the site.

The composition of climax and present plant communities, together with other range site information, provides the basis for selecting range management systems.

Management programs on range generally try to increase desirable plants and restore range to as near climax condition as possible. Some programs are designed to create or maintain plant communities somewhat removed from the climax to fit specific needs in the grazing program, to provide for wildlife habitat, or for other benefits. Any management objective should be compatible with conservation objectives."

Range Site NV 28-21 (Semidesert Loamy Plain). "This site is on old flood plains, fans, and lake terraces. Slopes are 0 to 15 percent. Elevation is 5,700 to 6,800 feet. Average annual precipitation is 8 to 12 inches, average annual air temperature is 41° to 46°F, and the frost-free season is 50 to 100 days.

These soils are somewhat excessively drained to well drained. The surface layer is moderately coarse textured to medium textured and the subsoil and substratum are moderately fine textured to moderately coarse textured. Permeability is slow to rapid. Available water capacity is low to high. Runoff is slow to

medium, and the hazard of erosion is slight to moderate. Effective rooting depth is 20 to 60 inches.

The potential plant community is big sagebrush and an understory of bunchgrasses and forbs. The composition, by weight, is about 60 percent grasses, 15 percent forbs, and 25 percent shrubs. The main grasses are bluebunch wheatgrass, squirreltail, basin wildrye, Indian ricegrass, Sandberg bluegrass, and needle-and-thread; each makes up 5 to 10 percent of the total community. Slender wheatgrass, blue grama, galleta, Salina wildrye, and annual grasses together make up another 5 to 10 percent. The forbs include aster, phlox, buckwheat, and annual forbs; they make up 5 to 15 percent of the community. Of the shrubs, big sagebrush makes up 15 to 20 percent of the total community and Douglas rabbitbrush, black sagebrush, winterfat, ephedra, fourwing saltbush, and spiny hopsage make up the other 5 to 10 percent. Traces of pinyon and bitterbrush are in some areas.

If this site is in excellent condition, the total annual yield of air-dry herbage ranges from about 1,000 pounds per acre in favorable years to 500 pounds per acre in unfavorable years.

If the range condition deteriorates, big sagebrush and Douglas rabbitbrush increase and halogeton and Russian-thistle invade the site. Following fire or other severe disturbance, cheatgrass, mustard, Russian-thistle and halogeton invade.

All soils in this range site are suited to range seeding when needed; results are good to fair. Brush management is needed if range is in poor or fair condition; sufficient remnants of desirable grasses must be present. Contour furrows and diversions together with brush management and range seeding are needed in places to retard runoff and erosion. Good grazing management is essential to improving and maintaining range condition".

Range Site NV 28-29 (Semidesert Loamy Slope). "This range site is on benches, fans, terraces, and foot slopes. Slopes are 2 to 50 percent. Elevation is 5,500 to 7,200 feet. Average annual precipitation is 8 to 12 inches, average annual air temperature is 42° to 47°F, and the frost-free season is 50 to 100 days.

These soils range from shallow to very deep and well drained. The surface layer is gravelly, stony, and cobbly and is moderately coarse textured, medium textured, and moderately fine textured. The subsoil and substratum are medium textured to fine textured and contain gravel. A duripan or bedrock, or both, underlie most of these soils at a depth of about 30 inches. Permeability is moderate to very slow. Available water capacity is very low to high. Runoff is slow to rapid, and the hazard of erosion is slight to severe.

The potential plant community is characterized by codominance of shrubs and grasses, mainly big sagebrush and basin wildrye. The composition, by weight, is about 50 percent grasses, 10 percent forbs, and 40 percent shrubs. Dominant grasses are basin wildrye, bluebunch wheatgrass, needle-and-thread, Sandberg bluegrass, Indian ricegrass, and squirreltail; each makes up 5 to 10 percent. Salina wildrye, galleta, and slender wheatgrass make up 5 to 10 percent. Forbs are aster, phlox, globemallow, buckwheat, and annuals; they make up 5 to 10 percent. The community is 15 to 20 percent big sagebrush, 5 to 10 percent fourwing saltbush, spiny hopsage, black sagebrush, and Douglas rabbitbrush.

If this site is in excellent condition, the total annual yield of air-dry herbage is 800 pounds per acre in favorable years and about 500 pounds per acre in unfavorable years.

If range condition deteriorates, big sagebrush and Douglas rabbitbrush increase and the main grasses, including Basin wildrye, bluebunch wheatgrass, and needle-and-thread, decrease. Winterfat,

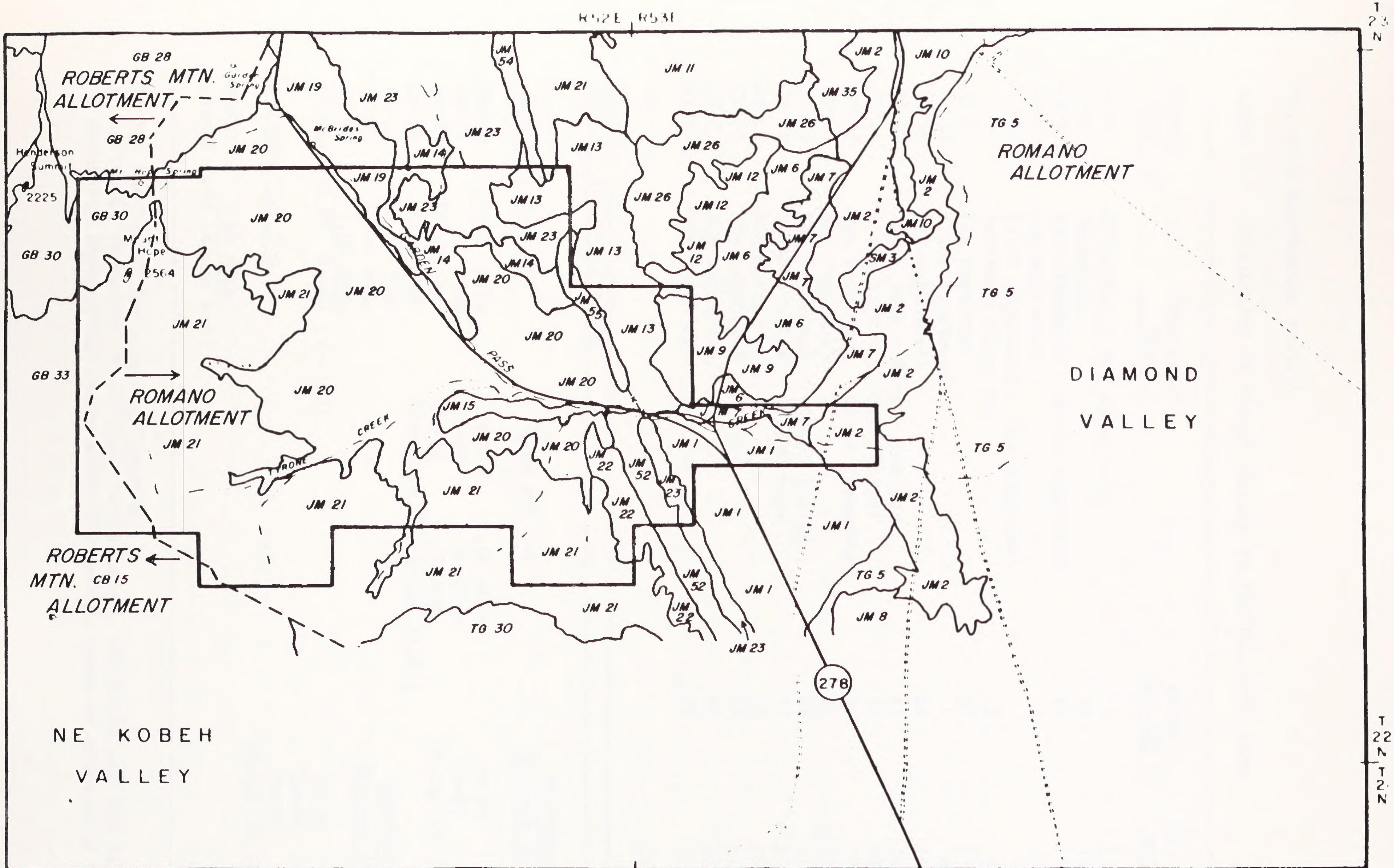
fourwing saltbush, and spiny hopsage may also decrease under continuous heavy grazing.

Good grazing management is essential to maintaining desirable range condition or to improving range condition. Selective brush management is sometimes needed if sufficient remnants of desirable species are present. The site is suitable for range seeding on the more gently slopes where all remnants of desirable species are destroyed".

The Battle Mountain District has a total of six planning units, accounting to 469,566 AUMs in (1979) (HDR, 1980b). The Mt. Hope region includes portions of two separate planning units within the Battle Mountain District: the Devils Gate Planning Unit, which includes the Romano Allotment, and the Pony Express Planning Unit which includes the Roberts Mountain Allotment. The Devils Gate and Pony Express Planning Units totalled 61, 675 and 71,441, AUMs, respectively in 1979 (HDR, 1980b).

The Romano Allotment, with a total of 3,034 to 3,708 AUMs in an area of 67,450 acres, comprises 4.9 to 6.0 percent of the AUMs within the Devils Gate Planning Unit. The Roberts Mountain Allotment, with a total of 18,444 to 22,542 AUMs in an area of 227,000 acres, comprises 25.8 to 31.5 percent of the AUM's within the Pony Express Planning Unit. Allotment boundaries within the Mt. Hope region are illustrated on Figure 2-2, in addition to AUM vegetational areas. Table 2-4 lists the calculation of forage values in the Mt. Hope area and AUMs for the proposed component locations of the Mt. Hope project. The AUMs available for grazing within the Mt. Hope site are 358-438. Approximately 87 percent (311-381) exist within the Romano allotment, and 13 percent (47-57) exist within the Roberts Mountain allotment.

The range user in the Romano Allotment is licensed to run cattle from April to December and the range user in the Roberts Mountain Allotment is licensed to run cattle and sheep from March to December. Both range users are currently using their allotments within the Mt. Hope site.



LEGEND

- EPHEMERAL STREAM
- 2155 SPOT ELEVATION
- RANGE ALLOTMENT BOUNDARY
- STATE ROUTE
- PROPOSED PROJECT BOUNDARY

R52E R53E

CONTOUR INTERVAL 50 METERS (164 FT)

0 1/2 1 2 MILES

0 1/2 1 2 3 KM

N

MLE AREA

BASE MODIFIED USGS TOPO QUADRANGLES, GARDEN VALLEY & WHISTLER MTN, NEVADA

MT. HOPE MOLYBDENUM PROJECT

BOUNDARY MAP OF AUM VEGETATIONAL AREAS

US Department of the Interior
Bureau of Land Management

FIGURE 2-2

Table 2-4 Calculation of Forage Values in the Mt. Hope Area

Survey Code 1/	Vegetation Type	Acres Per AUM 2/	Mt. Hope Acres	Total AUMs
JM-7	Winterfat - Big sagebrush	7	139	20
JM-2	Shadscale	19	147.4	8
JM-6	Big sagebrush - Black sagebrush	43	45.7	1
JM-9	Big sagebrush	5	159.4	32
JM-23	Black sagebrush - Big sagebrush - Sandberg bluegrass	18	73.6	4
JM-1	Big sagebrush	27	249.8	9
JM-55	Black sagebrush	0	81.5	0
JM-52	Big sagebrush	27	140.5	5
JM-13	Black sage - Pinyon juniper	13	244.5	19
JM-14	Black sage - Pinyon juniper	18	388.8	22
JM-15	Big sagebrush - Black greasewood	32	154.1	5
JM-20	Big sagebrush	25	2,515.1	101
JM-19	Big sagebrush - Pinyon juniper	25	115	5
JM-21	Pinyon juniper - Black sage	37	4,263.4	115
JM-22	Black sagebrush	23	151.6	7
GB-30	Big sagebrush - Pinyon	13	315.2	24
GB-33	Big sagebrush	30	383.9	13
GB-15	Big sagebrush - Juniper	30	243	8
			Total	398
			(Range 358-438)	

AUMs by Action Location

Tailings Pond 4-A

JM-20	84.0 AUMs
JM-23	1.11 AUMs
JM-21	18.63 AUMs
JM-14	22.55 AUMs
JM-15	6.27 AUMs
GB-30	3.23 AUMs
JM-22	1.08 AUMs

(Total 136.87, Range 123-150)

Plant Site 9-A

GB-30	7.69 AUMs

(Total 7.69, Range 6-8)

Mine Pit 7-A

JM-21	18.18 AUMs
GB-30	1.36 AUMs
JM-20	0.17 AUMs

(Total 19.71, Range 17-21)

Non-Mineralized Storage Area (South)

JM-20	1.86 AUMs
JM-21	43.25 AUMs

(Total 45.11, Range 40-50)

Non-Mineralized Storage Area (North)

JM-20	36.16 AUMs
JM-21	4.48 AUMs
GB-30	2.14 AUMs

(Total 42.78, Range 38-47)

1/ See Figure 2-2 for area delineation.
2/ Variable, dependent on climate, soils, etc., the Acres per AUM value are generally expected to range within 10 percent plus or minus as a total.

2.2.4 Mining/Mineral Exploration

Mining and mineral exploration land uses have been extensive throughout Nevada. Between 1976 and 1982 a total of 263,997 mining calims were filed with the BLM. In 1982 there were more claims recorded in Nevada than in any other western state. Total active claims in Nevada as recorded by the BLM numbered 241,158 in 1982.

The minerals industry in Nevada views public lands as an area for mineral exploration and development (only 15 percent of the total land in Nevada is privately owned. Acquisition of public lands is possible by four mechanisms: (1) claims, (2) lease/permit, (3) purchase, and (4) exchange.

The General Mining Law of 1872 (30 USC 26) gives individuals the right to go upon open (unappropriated and unreserved) public lands for the purpose of mineral prospecting, exploration, development, and extraction. This right is initiated by prospecting for minerals and, upon discovery thereof, by locating the lands upon which such discovery has been made. A location is made by staking the corners of the claim, posting notice of location thereon, and recording the location with appropriate state authorities and the BLM. In order to hold possessory right to the claim, the filer must annually file with the BLM proof of assessment work (not less than $100 worth of labor or improvements made thereon annually) and notice of intention to hold the claim.

Claims, as described in 43 CFR 3800-3870, are the three types: mining, tunnel site, and mill site. Locators of mining claims have the exclusive right of possession of the surface of such claims for mining, processing and related activities. Tunnel site claims give the claimant "possessory right to 1,500 feet of any blind lodes cut, discovered, or intersected by such tunnel which were not previously known to exist within 3,000 feet from the face or point of commencement of the tunnel". Millsite claims may be filed for the purpose of occupying nonmineral lands for mining, milling, processing, beneficiation or other operations in connection with mineral extraction. Surface fee ownership and subsurface mineralization may be conveyed in patents to either mining or millsite claims.

A land use lease/permit may be issued under the authority of FLPMA (43 USC 17313). A permit conveys no possessory interest, but is merely an authorization for use of public lands not to exceed three years where either little or no land improvement, construction or investment is planned, or where investment can be amortized within the term of the permit. A lease conveys a possessory interest for use of public lands involving substantial construction, development or land improvement and is issued for a term having no regulatory restriction other than that it be consistent with the time required to amortize the capital investment.

FLPMA (43 USC 1713) allows for the sale of public lands, as a result of land use planning, if the tract is difficult, uneconomic or unsuitable for Federal management; is no longer required for the purpose for which it was acquired; or its disposal will serve important public objectives. Sales of tracts in excess of 2,500 acres are subject to Congressional review. Sales may be conducted through competitive bidding, modified competitive bidding or by direct sale. On July 1, 1980 regulations promulgated by the BLM implementing this provision became effective (43 CFR 2700).

FLPMA (43 USC 1716) also provides for the exchange of public lands for private lands within the same state. In making the exchange decision the Secretary of the Interior must consider federal land management goals and the needs of state and local residents. Regulations delineating exchange procedures were promulgated by the BLM on January 6, 1981 (43 CFR 2200).

Eureka County has, over the years, had countless numbers of mines, many of which have been abandoned. There are a total of nine mining districts in the county, accounting for 15 mine/process operations that were active in 1982. The Mt. Hope Mining District and surroundings are not incorporated in any proposed Federal withdrawal areas. Approximately 300 acres of patented ground are located around the Mt. Hope Mine, and the surrounding land is administered by the BLM.

Major mining operations are the Carlin Gold Mine (25 miles north of Palisade), Nevada Barth Mine - iron ore (8 miles southwest of Carlin) and Dunphy Barite Mine (at Dunphy). In total there are five barite mines, seven

gold mines, one gold/silver mine, one silver mine and one magnetite (iron ore) mine. There are also two saline deposits in the county (Williams Marsh and Diamond Valley).

Eureka County experienced its first oil field discovery in 1982 in Pine Valley (Blackburn Field). Federal oil and gas leases in effect for Eureka County totalled 688 in 1982 and accounted for 1,338,098 acres (Nevada Bureau of Mines and Geology, 1983). Heavy oil and gas leasing activity has also taken place in Little Smoky Valley (T 16 N, R 53 and 54 E; T 15 N, R 52, 53 and 54 E)

Geothermal resources also exist in Eureka County, primarily at Beowawe (Beowawe Geysers) which is documented as a 12,712 acre geothermal resource area (HDR, 1980c from Mendive, 1976). Geothermal leases in effect in 1982 totalled 14 and accounted for 15,539 acres in Eureka County (Nevada Bureau of Mines and Geology, 1983).

2.2.5 Recreation

Recreation has proven to be an important activity for Nevada residents and for out-of-state visitors. Recreational activity has been strongly associated to personal well being and health. Recreation use of natural resources and outdoor settings, as referenced by HDR (1980b; from Geist, 1978) is essential to "increasing the individual's physical, intellectual and social competence which in turn maximizes health, develops a sense of mastery, and increases life span".

Nevada had 3,504,153 visitors to its 19 State Parks in 1980, 60 percent of which were Nevada residents. Eureka County residents comprised less than one tenth of one percent of the resident State Park visitors in 1977. Hunting and fishing licenses issued in 1980 for Nevada amounted to 42,015 and 82,392, respectively (5.2 and 10.3 percent of state population, respectively). Short term fishing licenses equalled 3,035 and registered boats numbered 27,470.

Lands involving a recreational use commitment are limited in Eureka County and the Mt. Hope area. BLM lands provide the major areas of dispersed recreation activity involving hunting, fishing, hiking, rock-hounding, etc.

Recreational development in the County for use by local residents is now practically non-existent in many respects, and because of the low population, the raising of funds for the development of adequate recreational facilities through taxation or bonding issues proves to be a problem. Eureka County has no major recreational areas and no major federal or state lands have been established for centralized recreational purposes (e.g., improved campgrounds). The nearest such site to the Mt. Hope/Eureka Town area is the BLM administered Hickison Petroglyph Site in Lander County (approximately 45 miles east of Eureka, 200 visitor days).

An outdoor recreational facility inventory in 1976 revealed a total of 699 acres for such use existed in Eureka, of which 95.4 percent were for private use. The majority of land areas for centralized recreational use (picnic and rodeo grounds, museums, etc.) are located in close proximity to community population centers. Table 2-5 lists the recreational resources and facilities in Eureka County.

According to a report documented by Conger (1974) and published by the Department of Conservation and Natural Resources under the title, Recreation in Nevada, III, 1971, the fifteen most popular outdoor recreational activites with Nevadans are ranked as follows:

1. Sightseeing
2. Swimming
3. Playing Outdoor Games
4. Bicycling
5. Picnicking
6. Camping
7. Urban Walking/Jogging
8. Playing Urban Games
9. Fishing
10. Viewing Outdoor Activities
11. Hiking and Climbing
12. Boating, Sailing and Canoeing
13. Playing Golf
14. Motorcycling
15. Hunting

The following discussion will cover each one of these activities in relation to Eureka County and has been abstracted and modified from the Eureka County General Plan (1974).

1) Sightseeing: Eureka County ranks high among the counties of Nevada with regard to scenic aspects. Two of the State's

Table 2-5 Recreational Resources and Facilities in Eureka County

*** Resources	Total
Total Water and Land Acres (public and private)	35
Water Acres	0
**** Total Turf Acres	3
Parks	
School Play Areas	1
Neighborhood/City	1
Regional/County	2
Water Sport Facilities	
Swimming Pools	1
Swimming Area (Sq. Ft.)	2,850
Outdoor Sport Facilities	
Tennis Courts	1
Spectator Facilities	
Rodeo Arenas	1
Picnic and Camping Facilities	
Picnic Tables	2
Campsites	30

*** The reader should note that these figures are estimates based on a survey conducted by the Nevada Division of Parks. Total results reflect those questionnaires that were returned to that division.

*** Turf acres represent improved (green) areas.

Source: State of Nevada, Office of Community Services. Eureka County Nevada Profile, 1982

outstanding natural phenomena are within Eureka County. The Palisade Canyon, a gorge cut by the Humboldt River, and the Geysers at Beowawe offer sightseers occasion to view nature in action. The County contains vast expanses of open space which afford everyone the chance to enjoy unspoiled countyside.

2) Swimming: This activity has been badly inhibited due to the lack of facilities. There exists only one swimming facility in Eureka County, the community swimming pool in the Town of Eureka which has a swimming area of 2,850 square feet. The only other area where swimming might take place is in the Humboldt River, but this is some distance from the bulk of the population.

3) Playing Outdoor Games: Again, these activities have suffered through the lack of facilities. Limited baseball and football facilities exist in conjunction with the schools in the Town of Eureka, and one rodeo ground is located just south of the Town of Eureka. One outdoor tennis court is available; other facilities for outdoor games simply do not exist.

4) Bicycling: Beyond the existing streets and roadways, there are no bicycle paths or trails. The low population of urbanizing centers, and of the County at large, probably have not yet exerted pressure for facilities in this area as much as some of the other activities.

5) Picnicking: The concept of picnicking has been undergoing change over the last decade. Where once it was acceptable to spread a blanket under a tree by a stream or within view of some other scenic vista, today's picknicker prefers to have tables, benches, bar-b-que pits, tapwater and restroom facilities before picnicking can take place. In the more sophisticated sense, picnicking facilities are limited to the small municipal park in the Town of Eureka and the rest stops adjacent to US-50 traversing the County. For those

who still operate under the old concept, the County affords virtually unlimited open areas which may be utilized by local residents.

6) Camping: Again, the lack or abundance of facilities depends upon the individual concept of camping. In terms of improved campsites, there are none; however, from the "roughing it" aspect, the opportunities for campers within Eureka County are only limited by the County lines. The Battle Mountain BLM has indicated four areas which are frequently used by some as campsites: Western Peak, Henderson Summit, Roberts Creek Mountain and Richmond Mountain. These sites are unimproved except for BLM-furnished trash can service. Travelling northwest of Mt. Hope, the unimproved campsites of Henderson Summit, Roberts Creek Mountain and Western Peak are located 1.2, 8.3 and 12.0 miles away, respectively. Richmond Mountain is located 1.5 miles southeast of Eureka.

7) Urban Walking/Jogging: Because of the lack of open space in most urban areas, land must be set aside and facilities specially constructed for these uses. This is not the case in Eureka County. The average local resident has but to step out of his door to find adequate area within which to carry on these activities. However, the problem of "wild" dogs may be a possible danger to those desiring to walk or jog.

8) Playing Urban Games: The lack of population of a true urban nature again has not brought pressure to bear to provide facilities for these activities, which include golf and tennis. The sheer cost of a golf course in proportion to the number of people who would utilize it, probably precludes such facilities within the lifetime of this Plan.

9) Fishing: Some opportunities exist for anglers to ply their skill within the county, and in neighboring counties. Fishable waters which are stocked by the State Division of Fish

and Game with a variety of species of fish are within a day's drive of residents of Eureka County. Approximately 24 percent of the population of Eureka County expresses an interest in fishing by purchasing a fishing or combination hunting and fishing license each year. Eureka County has approximately 24 miles of fishable stream and 35 acres of flat water. The principal streams are Denay Creek, Cottonwood Creek, Pete Hanson Creek, Vinini Creek and Roberts Creek. The Humboldt River in far northern Eureka County also offers 42 miles of fishing.

10) Viewing Outdoor Activities: As a form of recreation, viewing outdoor activities can fare no better than the outdoor activities themselves. As indicated in category three, facilities for these activitiets are severly limited.

11) Hiking and Climbing: Again, the vast open areas of Eureka County come to the forefront a valuable resource. The opportunity to participate in this activity is available to all residents of the County. It is presumed that this and other forms of outdoor activity rate higher among the citizens of Eureka County than those of the State at large, hence the reason for settling in a non-urban area and being vitally interested in preserving the rural aspect of the County.

12) Boating, Sailing and Canoeing: The lack of any body of water of sufficient size to accommodate these activities within Eureka County indicates that those who wish to take part must make use of facilities in neighboring counties. The short stretch of the Humboldt River in the northern part of the County presents the possibility of canoe or raft races, but is still some distance from the major part of the population.

13) Playing Golf: For the purposes of this report, golf is included under number 8) Urban Games, because from a practical standpoint larger urban centers can more easily afford

the construction and maintenance costs connected with golfing facilities.

14) Motorcycling: Sport motorcycling takes two popular forms. Open road motorcycling for the sake of sightseeing has been popular since the advent of the machine. The phase of the sport known as "dirt biking" has been growing in popularity in recent years to the point that it seems to have surpassed that of open road touring. Again the wide open aspect of Eureka County and the many miles of roadways, both improved and primitive, present the motorcycle enthusiast with virtually unlimited recreational opportunities.

15) Hunting: It is highly doubtful that hunting truly occupies last place as a recreational pursuit in the hearts of the Eureka County residents. The nearly untouched condition of the wildlife habitats, and the abundance of wild game of diverse types attracts not only local hunters but many from other counties as well. The Battle Mountain BLM District (of which Eureka County is part of) reveals statistics showing that hunters depend on public lands for about 31,000 out of a total of 53,000 hunter days (a 57 percent dependence). Table 2-6 lists game types available to hunters in Eureka and surrounding counties.

Residents of Eureka County appear to seek the recreational activities which are encouraged by the open aspects of the area, rather than activities of an urban nature, with the exception of swimming.

For Eureka County, the future development of recreational use areas on public lands is planned to a limited extent. Increased utilization of the Toiyabe National Forest, partially extending into the southwest corner of Eureka County, may warrant improved recreational site development in the future although the U.S. Forest Service does not anticipate any major recreational developments between 1983 and 1990 (HDR, 1980b). BLM's proposed

Table 2-6 Game Types Available to Hunters in Eureka and Contiguous Counties

County	Sage Grouse	Blue Grouse	Partridge	Quail	Pheasants	Rabbit	Dove	Ducks	Geese	Deer	Antelope	Bighorn Sheep	Mountain Lion	Fur Bearers 1/
Eureka	x	x	x	x	x	x	x	x	x	x			x	x
Elko	x	x	x	x	x	x	x	x	x	x	x		x	x
Lander	x		x	x	x	x	x	x	x	x	x		x	x
Nye	x		x	x	x	x	x	x		x	x	x	x	
White Pine	x	x	x	x		x	x	x		x	x		x	x

1/ Fur bearers are trapped rather than hunted. The species which are found in Eureka and the surrounding counties are Beaver, Muskrat, Mink, Otter, Racoon, Bobcat, Coyote, and Grey Fox.

Source: Eureka County General Plan, 1974.

management plans regarding the Roberts Wilderness Study Area and surrounding environs do not encompass recreational facility/area developments.

2.2.6 Timber Products and Pine Nut Gathering

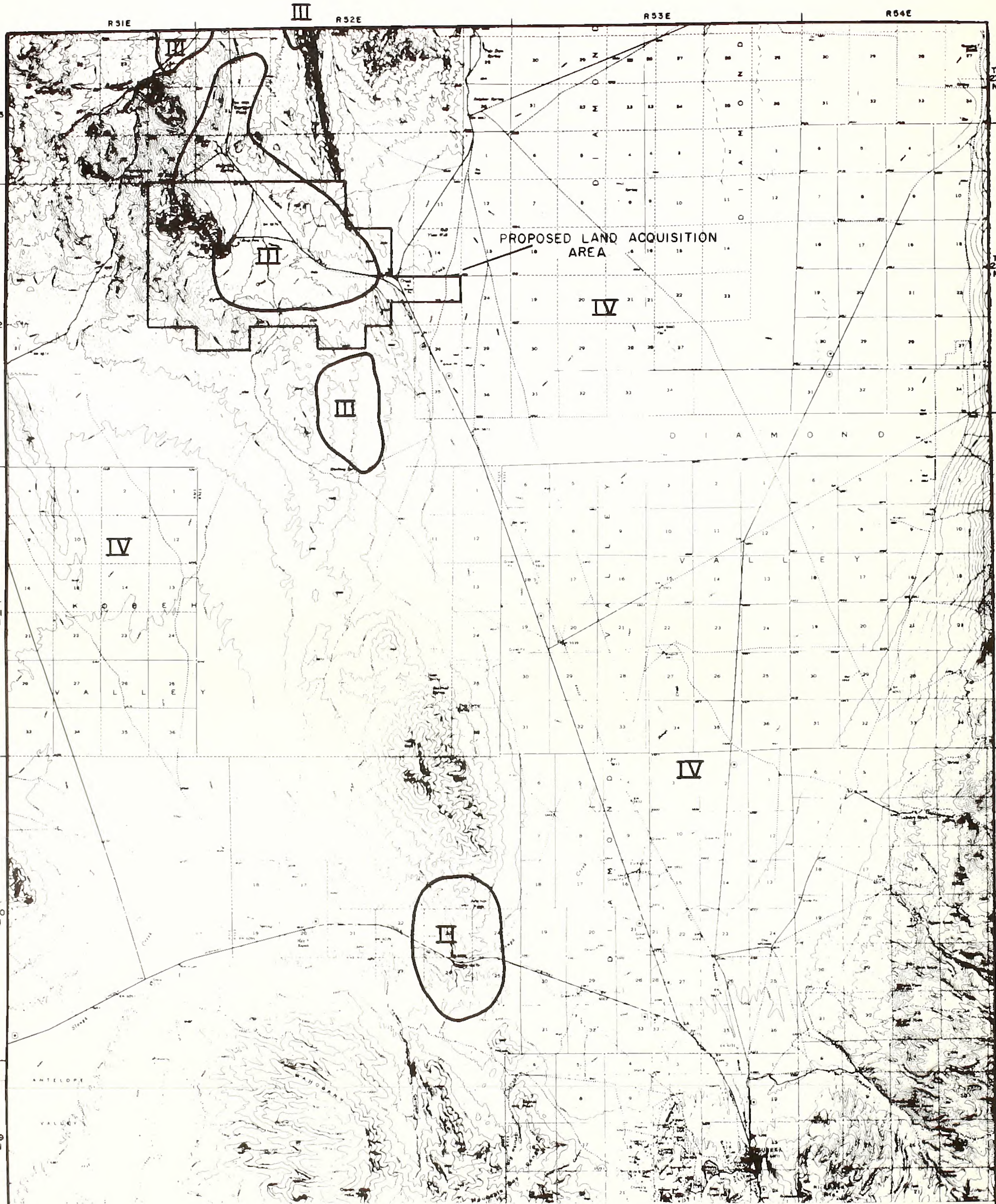
There are nearly 600,000 acres of pinyon-juniper woodland classified as forest available for woodland products management in the Shoshone-Eureka Resource Area. Of this, less than 20 percent or 120,000 acres is currently accessible for woodland harvest. Demand for woodland products has been steadily increasing over the last decade. Current annual demand is for approximately 1,000 cords of firewood, 5,000 Christmas trees, 4,000 juniper posts, and 52,500 pounds of pine nuts (USDI, 1983a).

The Mt. Hope site study area represents a prime commercial Christmas tree site which currently produces a sustained yield of 300 to 500 trees annually. Fair to good crops of pine nuts are additionally reported in the site study area (USDI, 1983b).

2.2.7 Visual Resources

Visual Resource Management Classes set limits on the amount of contrast which will be allowed in an area between a management activity (road, power line, fence, etc.) and the existing landscape. All areas in the Shoshone Eureka Resource Area fall into Class IV, III, or II. The Mt. Hope area encompasses lands characterized as Class III and Class IV. Figure 2-3 shows visual resource class areas in the Mt. Hope region.

Class IV, the least restrictive of the three classes, predominates in the Mt. Hope area. Most of the Shoshone Eureka Resource Area has been designated as Class IV. A management activity in this class could draw attention as a dominant feature in the landscape, but it should be planned so as to minimize the contrast by repeating the form, line, color, and texture of the characteristic landscape. Contrast from management activity in the Mt. Hope area is primarily due to the following features: State Highway 278, telephone/power line poles, pipeline, stockwater tank, material



——— PROPOSED LAND ACQUISITION AREA BOUNDARY

Nevada MAP AREA

0 1 2 3 4 5 Miles

0 1 2 3 4 5 6 7 8 Km.

N

BASE USGS TOPO QUADRANGLES, GARDEN VALLEY, WHISTLER MTN., DIAMOND SPRINGS & EUREKA, NEVADA.

MT. HOPE MOLYBDENUM PROJECT	
VISUAL RESOURCE MANAGEMENT CLASS AREAS	
U.S. Department of the Interior Bureau of Land Management	FIGURE 2-3

sites, windmill, abandoned railroad grade and road and buildings associated with previous mine activity at Mt. Hope.

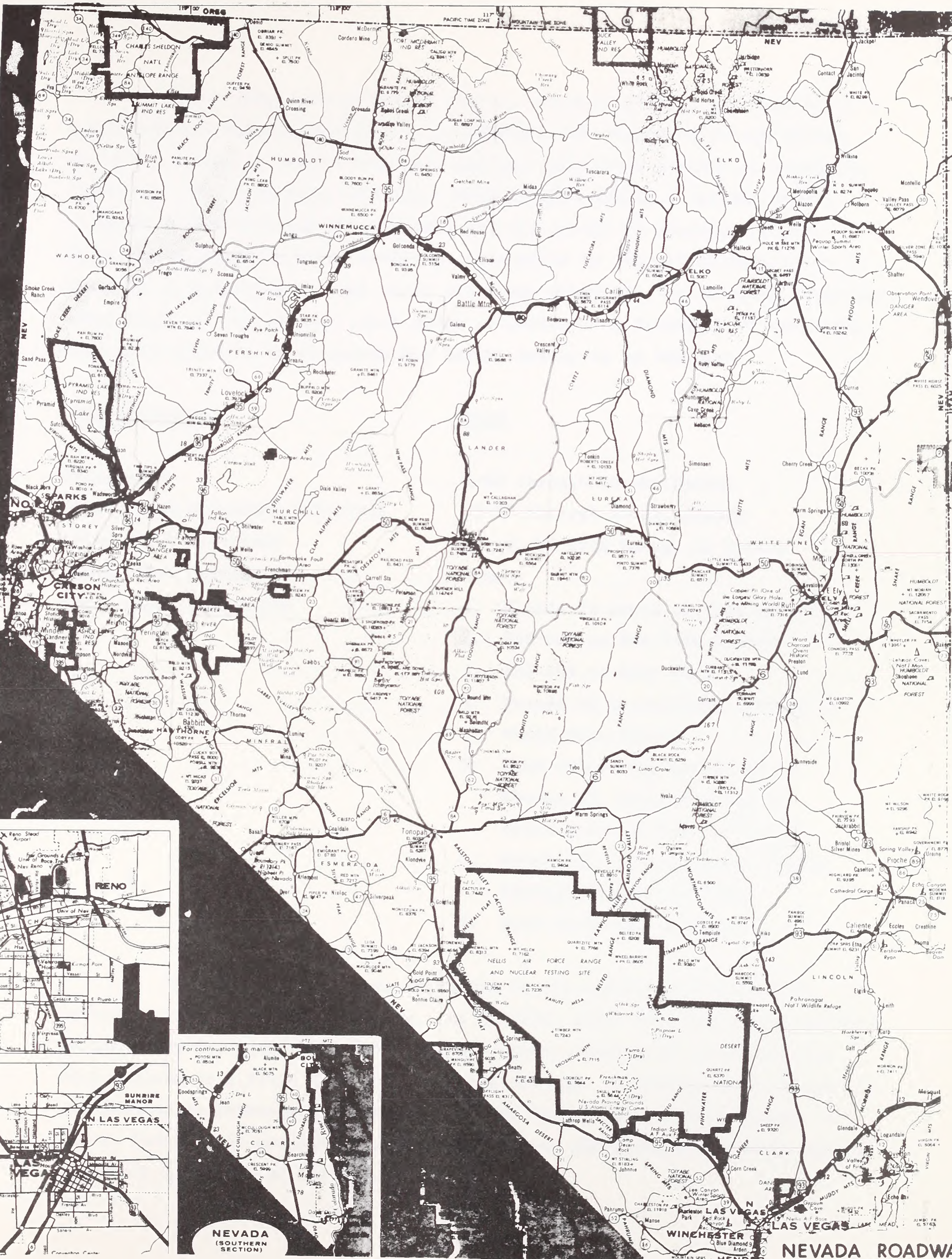
A Class III area in the vicinity of Mt. Hope generally encircles the portion of State Route 278 entering the project area through the erosional gap of Sulphur Springs Range and then extending to the north. In a Class III area, a management activity is expected to be evident, but does not draw attention to itself as a dominant feature in the landscape. Other Class III areas in Eureka County are along the east and west sides of Garden Valley (north of Mt. Hope), portions of the Simpson Park Range and a small area to the north of the Town of Eureka.

In a Class II area, a management activity may be visible, but must not attract attention as a contrast to the landscape. The Roberts Wilderness Study Area has been designated as Class II in addition to the Devils Gate area (seven miles east of the Town of Eureka), along U.S. Highway 50, entering into Kobeh Valley.

2.3 Transportation

Nevada's total mileage for roads and streets was 50,746.5 miles in 1980. The existing road system is a network of federal, state and county highways (see Figure 2-4). Interstate Routes 15 and 80 provide major means of access into Nevada. Interstate Routes are four-lane divided roadways and highways are primarily two-lane paved roads, with the exception of Nevada Route 46 and portions of Route 21 (both located in Eureka County), which are unpaved. Existing highway conditions in Nevada are of sufficient capacity to handle current traffic volumes and excess traffic levels. Volumes vary on I-15 from 2,500 to 6,800 vehicles per day (vpd) and on I-80, from 2,800 to nearly 4,000 vpd (HDR, 1980d).

The capacity of most sections of two-lane highways is relatively high with the ability to accommodate 7,000 to 10,000 vpd. These calculations were arrived at through capacity analysis with assumptions for the amount of trucks in the traffic stream and certain peaking characteristics (Nevada Department of Transportation, 1979; Highway Capacity Manual, 1965).



NEVADA ROADWAY SYSTEM

FIGURE 2-4

In an area such as Eureka County, the availability and quality of a transportation network adequate to accommodate the necessarily long travel distances caused by remote locations and low population density is extremely important. The presently existing transportation system of Eureka County includes well-maintained ground, rail and air routes of adequate volume. Roads and highways in rural areas are classified by the Nevada Department of Highways as interstate, other rural principal arterials, rural minor arterials, rural major collectors and rural minor collectors. A breakdown of the roads into this classification system for Eureka County is as follows:

Classification	Road
Interstate	I-80 through Eureka County
Other rural principal arterials	US-50 through Eureka County
Rural minor arterials	Nevada 51 from Eureka to Carlin
Rural major collectors	None
Rural minor collectors	1. Nevada 20 south of Town of Eureka 2. FAS 603 up New York Canyon 3. FAS 604 to Ruby Hill 4. Nevada 46 to northwest corner of White Pine County 5. Road connecting Nevada 46 to Nevada 20, approximately 19 miles north of Town of Eureka 6. Nevada 21, from Crescent Valley through Beowawe to I-80. 7. Road to Beowawe geysers

The public road system in Eureka County comprises a network of federal, state and county highways. As of 1980, total road and street mileage in Eureka County equalled 1,904.4 miles. County rural roads accounted for 90.4 percent or 1,721.6 miles of the total mileage. Remaining road mileage is distributed as interstate system 25.7 miles, federal aid primary system 47.4 miles, federal aid secondary system 103.1 miles, and a state aid route system entailing 6.6 miles of roadway.

The primary roadway pattern is city-oriented. State Route 278 (also mapped as State Route 51) extends north-south toward Carlin-Elko and Eureka. This state route joins U.S. Highway 50 about three miles northwest of Eureka and crosses part of the west side of Diamond Valley. It passes just east of Mt. Hope, following along Garden Pass and extends northward to Interstate 80 (I-80) at Carlin. U.S. Highway 50 crosses the extreme southern part of Diamond Valley and extends east-west (generally bisecting the Town of Eureka area) to Austin and Ely (west and east of Eureka, respectively). As the county seat, the Town of Eureka represents the focus of the county ground transportation network. The total number of licensed vehicles in the county equalled 1,376 as of 1980. Type-distribution of vehicles tended toward truck (650, 47.2 percent). Passenger cars and trailers accounted for a combined 713 units or 51.8 percent of the total (472 cars, 241 trailers). Motorcycles in the county totalled 13.

Intercounty transport does, however, add significantly to total road transport volumes. Annual averages of daily traffic volume (1981) indicate high utilization of U.S. 50 through Eureka with 1,535 to 1,680 vehicles per day. Travel on U.S. 50 immediately outside of Eureka averaged 680 vehicles per day (northwest portion toward Austin). State Route 278 traffic volume is substantially less, with approximately 205 vehicles per day travelling the two-lane north-south roadway near the Mt. Hope project site (NDOT, 1983).

The highest traffic volumes occur in northern Eureka County on I-80 (3,900 vpd; NDOT, 1979). Since the traffic counts on the off-ramps for Beowawe and Dunphy are quite low, it is evident that the great bulk of the volume is through-traffic. I-80 serves as the major artery through northern Nevada, connecting Salt Lake City and points east of Salt Lake with the tourist areas of Reno and San Francisco to the west. Outside the Town of Eureka and the Crescent Valley-Beowawe area, traffic counts have ranged from "low" to "very low".

Overall system capacity is adequate and service level designations vary throughout the system due to variable lengths of road with free flow capability (open, 50 mph speed limit under good weather conditions) as well

as significant mountain pass road lengths. One severe grade and alignment condition exists on the Richmond Mountain Pass section of U.S. Highway 50, located east of Eureka. This section extends from Eureka to 13 miles east of Eureka. Maximum grade is slightly over 4 percent, alignment is moderate and the theoretical capacity is 420 vehicles per hour (HDR, 1980d). Under these conditions, traffic operates at reduced levels of service, characterized by slow speeds and reduced passing opportunities. When coupled with relatively high levels of traffic, delay and congestion occasionally result primarily behind slow moving vehicles.

In addition to the primary highway system, numerous gravel and graded roads allow access to most county areas. State Highway 46, a graded gravel road originating in Eureka, extends along the eastern side of Diamond Valley, through Railroad Pass and northward into Huntington Valley where it connects with I-80 at Elko. State Highway 46 averages six vehicles per day (NDOT, 1979). Graded roads have also been constructed along most section lines in developed Diamond Valley areas. Development of roads in Kobeh Valley has been very limited, indicative of the associated low use patterns of the valley itself.

Greyhound Bus Lines operates one bus per day through the Town of Eureka (Reno to Ely run) and one major truck line (Central Nevada Truck Lines) serves the county with daily service to Reno and Ely.

Eureka County is serviced by two railroad lines. Rail transport of freight only is available at a joint company station in Beowawe (Figurski, personal communication, 1980). Minerals and cattle loading is the primary freight cargo. The nearest railway connections for passenger service are located at Ely (76 miles east of the Town of Eureka) and Carlin (about 100 miles north of the Town of Eureka). Both Southern Pacific and Western Pacific operate and maintain the railway system.

Two general aviation facilities exist in Eureka County, one at the Town of Crescent Valley (9 miles south of Beowawe in northern Eureka County), and one in Diamond Valley (Eureka County Airport) which is located approximately 7.5 miles north of the Town of Eureka. The Eureka County Airport has

a 4,800 foot long, paved runway with a 75 foot width, tie down area and public phone. The airport is maintained by the county and is suitable for light private and "light" commercial charter aircraft.

2.4 Noise

A variety of terms are employed in ordinary language to convey impressions of sounds; examples include howl, whistle, squeal, rustle, rumble, and hum. Most of these would be classed as noises. Sound which is unpleasant, unexpected, undesired or interferes with one's hearing of something is considered to be noise. The distinction between pleasant sound and noise is based largely upon the regularity of vibration of the source and the degree of damping, as well as the ability of the ear to recognize components that have a musical sequence (Hausmann and Slack, 1942).

The range of sound that can be heard by the human ear varies somewhat with the individual, but the average range is from 20 to 20,000 vibrations per second. Auditory sensation ceases when the intensity has been reduced to a sufficiently low level which is termed the threshold of audibility. Sound that produces the sensation of feeling and begins to be painful when the intensity has been increased to a sufficiently high level is termed the threshold of feeling.

Noise measurement is derived from the intensity of sound pressure level, the basic unit being the decibel or dB. Because of the great range of sound pressures that the human ear is capable of hearing (20 to 20,000 vibrations per second), a logarithmic scale is used. Table 2-7 lists common noise levels.

HDR (1980e) gives a good description of sound measurement and noise metrics as follows:

> "Humans do not hear all sound frequencies equally. In order to obtain a valid relationship between what we hear and sound measurements, a filter known as the A-weighting network is often used to discriminate against low and very high frequen-

Table 2-7 Common Noise Levels

dBA	Common Noise Levels
130	Threshold of Pain
120	Chipping on Metal
110	Rock Band
100	Jackhammer
	Jet Takeoff (1/2 mile)
90	Threshold of Hearing Damage
	Motorcycle (urban residential)
80	
	Busy Freeway
70	Ice Cream Truck with Music (urban residential)
	Power Lawn Mower (urban residential)
	Children Playing (urban residential)
60	Normal Conversation
50	Radio Playing Music (urban residential)
	Bird (normal suburban area)
40	Suburban Neighborhood (distant traffic)
30	
20	Quiet Rural Area (no traffic)
10	
0	Threshold of Audibility

Source: HDR, 1980e

cies. The resultant measurement is referred to as the A-weighted sound level in units designated as dBA. Different noise metrics have been developed for reporting various noise situations because of the time periods and averaging methods used in the measurements and the nature of noises under investigation. Examples of these are the equivalent continuous sound level (L_{eg}), the day-night average sound level (L_{dn}), and the percentile exceeded sound level (L_x).

Situations may arise in which an area is exposed to more than one noise source. Under these circumstances, the combined effect of the multiple sources is determined by adding logarithmically the contributions from all sources. As a result of this logarithmic method of dBA summation, when two sound levels are added and one is 5 dBA greater than the other, the overall sound level is only 1.2 dBA higher than the greater source".

Regulations and standards of noise and noise pollution is the concern of several federal, state and local government agencies. The Environmental Protection Agency (EPA) is the primary reviewer of all federal noise activities and also oversees vehicle noise limits. The Department of Housing and Urban Development (HUD) is involved with establishing noise exposure standards for residential construction. Nevada does not have formal noise regulations but, in general, local governments use the federal regulations as appropriate guidelines for their own noise control policies.

Some of the guidelines and recommendations set by the federal agencies are reviewed below. The Federal Highway Administration (FHWA) is responsible for setting noise standards for the location of new highways. The FHWA design levels for residences are shown as L_{dn} 67. However, the HUD criterion for noise exposure in residential neighborhoods is L_{dn} 65 (Ref. HUD 24 CFR 52.103(c)), and some state and local regulations use L_{dn} 60 as the criterion. Traffic noise depends upon traffic parameters (e.g., number of vehicles per hour, type of vehicles and average speed), roadway parameters (e.g., number of interruptions, stop signs, traffic lights, pavement traits

and percentage gradient) and observation characteristics. Observation characteristics are defined by HDR (1980e) as:

"the type of terrain between the observer and the roadway; whether buildings, barriers, or vegetation are present; high, solid barriers can attenuate sounds by fifteen decibels. Houses can reduce the sound by three to five decibels per rdw; distance and elevation of the receptors relative to the road and ground level; thermal and wind gradient influences on refraction of sound energy".

Land use compatibility recommendations by federal agencies have been proposed for some activities and are reviewed by HDR (1980e) as follows:

"Although recreational use has often been recommended as compatible with high noise levels, recent research has resulted in a more conservative view. Above L_{dn} 75, noise becomes a factor which limits the ability to enjoy such uses. With the exception of forestry activity and livestock farming, uses in the resource production, extraction and open space category are compatible almost without restriction. However, in extreme cases, the effects of high noise levels on wildlife should be considered.

Commercial/retail trade and personal and business services categories are compatible without restriction up to L_{dn} 70; however, they are generally incompatible above L_{dn} 80. Between L_{dn} 70-80, noise level reduction measures should be included in design and construction of buildings. The nature of most uses in the public and quasi-public services category requires a quieter environment, and attempts should be made to locate these uses in areas with a L_{dn} below 65, or else provide adequate noise level reduction measures".

In order to ascertain how the environment may be potentially affected by noise emission related to the proposed project, existing noise sensitive

receptors, noise sources, special terrain features and noise levels must be identified.

Noise sensitive receptors are areas or land uses in which people or wildlife could be adversely affected by project produced environmental noise. The effects of noise can generally be classified into three categories:

1) Subjective effects such as annoyance and nuisance.

2) Interference with activities such as speech communications, work, education and sleep.

3) Physiological effects such as loss of hearing and stress related problems including nervousness and high blood pressure.

Excessive noise and vibration can also cause physical damage to buildings and other structures.

The proposed project is located in a sparsely populated area that does not exhibit significant sources of man-made noise. The Mt. Hope site itself is somewhat isolated, being flanked by the Roberts Mountains to the west, foothills to the north and south and the Sulphur Springs Range to the east. An unpopulated area of Diamond Valley lies just east of the Sulphur Springs Range. The Town of Eureka is located approximately 22 miles to the southeast. The closest off-site residences are two ranches, located 8.5 miles to the northeast (Romano Ranch) and 6.25 miles to the southwest (Roberts Creek Ranch) of Mt. Hope.

Current man-made sources of noise within the Mt. Hope area are limited to: residential contributions (one source at Mt. Hope); EXXON activities on site; traffic along State Highway 278, off-road vehicular travel as occasioned by hunting, visitation, employment-seeking and site investigation activity; and, military overflights of variable frequency (Air Force training routes IR-275, IR-280/282). Due to the remoteness of the proposed project area and existing man-made noises at present, the existence

of measured data for similar remote areas may be applied. Remote noise area data (EPA, 1971) show that in natural environments, noise levels can be extremely low, on the order of 15 dBA and vary over a considerable range up to levels of approximately 45 dBA, depending upon what sources are present. As such it can be expected that noise levels in the Mt. Hope area would range from 20 dBA to 45 dBA.

With respect to the major project-sensitive human receptor of noise and, therefore, important baseline noise characterization, the Town of Eureka represents an area of particular interest. Lacking major industrial activity, the Eureka baseline noise levels may be expected to predominantly reflect vehicular traffic of automobile and truck use (excepting infrequent excursion of fire siren, church bells, rodeo exhibition, etc). Traffic noise sources are excluded somewhat from the center of Eureka because the major regional interchange (U.S. 50 - S.R. 278) is located 3.5 miles northwest of central downtown. Based on estimated traffic loads of 1980, maximum baseline noise levels are expected to range from 70 dBA (33 feet from road centerline) to 45 dBA (1,500 feet from road centerline). For comparison, a dBA of 70 is generally equivalent to the sound of a lawnmower and a dBA of 40 is equivalent to a suburban neighborhood with distant traffic noise background. A quiet rural area with no traffic commonly experiences noise at a 20 dBA level.

CHAPTER 3.0

IMPACT ANALYSES

3.1 Introduction

Implementation of the proposed action and alternatives would result in certain long-term and short-term alterations to the existing character of land use, transportation and noise levels within the project study area. The analysis of potential resource impacts was conducted with an emphasis on the following major critera of effects:

1) Transfer of public lands to private lands via FLPMA sale.
2) Transition of land use patterns - e.g., from grazing to mineral development.
3) Visual resources alteration.
4) Transportation system capability.
5) Noise impact upon unique receptors.

While other potential impacts may be identified, some of which are included in this Technical Report, the above listed points of emphasis represent the items of significant concern brought forth during EIS public scoping meetings and various agency communications.

Pertinent assumptions and certain guidelines to analysis of impact specific to the proposed action and alternatives are listed in Section 3.2. Results of the impacts analyses are presented by alternative and individual land use factors, (e.g., Transportation: Proposed Action Case 5-A, Subdivision and Alternative Case 5-B, Decentralized Workforce) in Sections 3.3 through 3.7.

Implementation of the no action alternative would generally negate the occurrence of impacts herein associated with the proposed action and other alternatives.

3.2 Assumption and Analysis Guidelines

The determination of environmental impacts upon the land use, transportation and noise resource bases required that certain assumptions be made which would affect conclusions regarding significance of impact and nature of impact (beneficial/detrimental). Project-specific assumptions used in the analyses are presented below.

1. It was assumed that the proposed action and alternatives, particularly the employment requirements anticipated by EXXON, described briefly in Chapter 1.0 of this Technical Report and in detail in Chapter 2.0 of the EIS and Technical Report No.1 would be implemented as described. Mitigation measures described in the EIS would be in place as described. Assumptions 2 through 9 below highlight particularly important aspects of the proposed action and alternatives described, as related to land use, transportation, noise and visual resources.

2. It has been assumed that the following employment requirements would be associated with the proposed action:

   The workforce associated with construction and operation is shown in Figure 3-1 and Table 3-1. The construction workforce would peak at approximately 940 people midway through the three year construction period. The operational workforce would grow steadily and level off at an estimated 640 employees. Stabilized annual populations would result in a total addition of 1,775 people.

3. For the purposes of impact analysis, a single proposal for housing of construction workers was assumed appropriate. Specifically:

   - A 450-unit camp would be built near the mine to house single and single-status personnel. It would be constructed of modular units for rooms, mess hall/kitchen and other buildings. The workers would be housed one person to a room and would be provided three meals/day, maid service and a recreational program. EXXON would

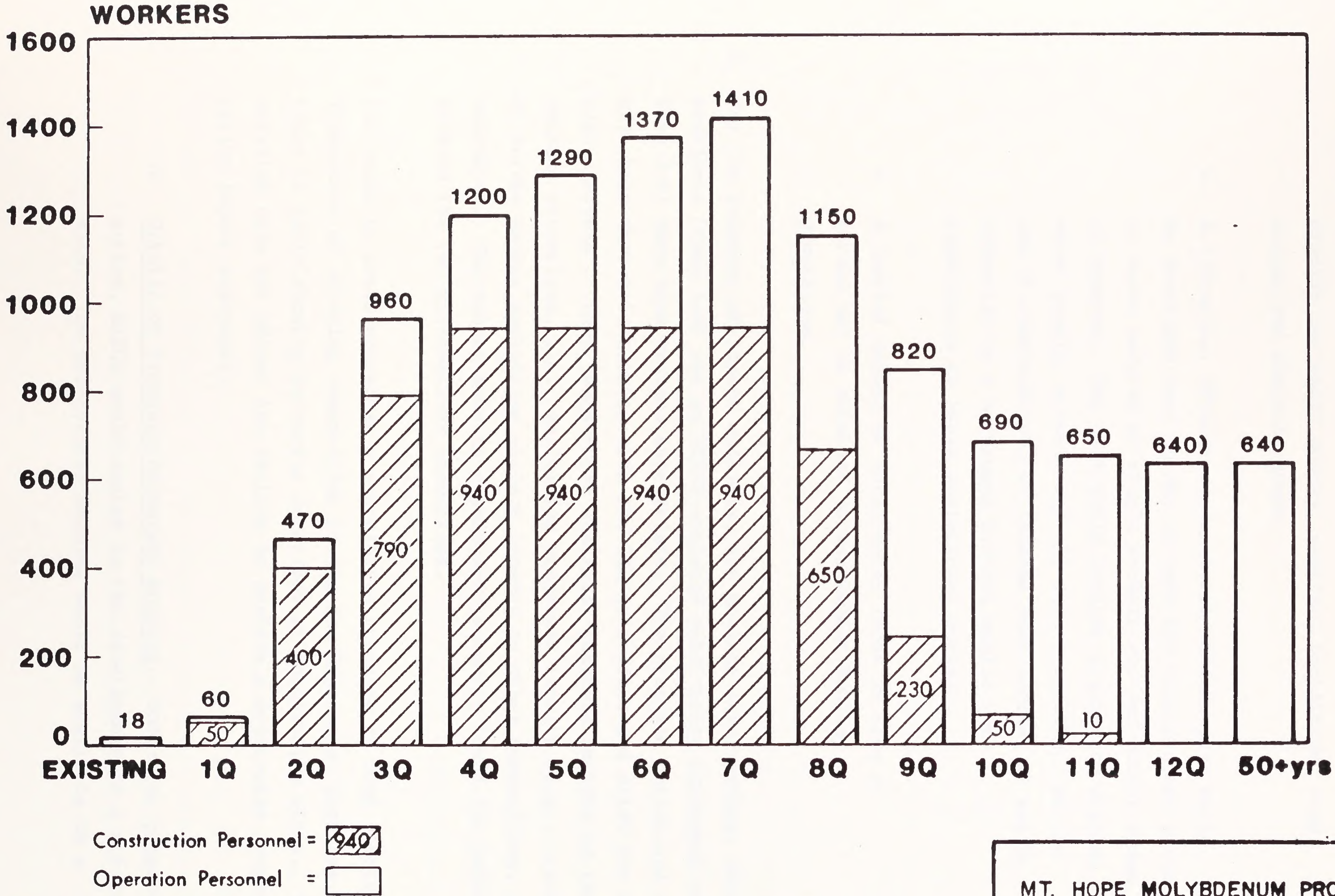
Table 3-1 Local and Non-Local Distribution of Total Workforce

	Existing	1Q	2Q	3Q	4Q	5Q	6Q	7Q	8Q	9Q	10Q	11Q	12Q
Local Personnel 1/													
Construction	2	5	40	80	94	94	94	94	65	23	5	1	0
Operation	--	4	12	30	47	63	78	84	90	106	115	115	115
Non-Local Personnel													
Construction	14	45	360	710	846	846	846	846	585	207	45	9	0
Operation	2	6	58	140	213	287	352	386	410	484	525	525	525
TOTAL	18	60	470	960	1,200	1,290	1,370	1,410	1,150	820	690	650	640

1/ Local Personnal are defined as workers currently living close enough to Mt. Hope (approximately 90 miles driving distance) so as not to require housing provisions.

Q = quarter year, 3 months; 3Q = third quarter, 4Q = fourth quarter, etc.

SOURCE: EXXON Minerals Company and WRC EIS Team



Q = Quarter Year (3 months)

SOURCE: EXXON MINERALS COMPANY

MT. HOPE MOLYBDENUM PROJECT

TOTAL WORKFORCE ESTIMATE

U.S. Department of the Interior
Bureau of Land Management

FIGURE 3-1

provide for water supply, sanitary facilities, road access and electric power.

- A 415-space, 50-acre recreational vehicle park would be developed near Eureka or near the mine/process plant to house married or single workers who own mobile homes or campers. The park would include a sanitary system, water supply, streets and off-street parking. At the end of construction, if located near Eureka, it may be converted to a permanent 210-lot mobile home subdivision to house operational workers.

- A limited number of hotel/motel rooms in Elko or Eureka may be retained to supplement housing provisions.

4. For the purposes of impact analysis, two housing alternatives, decentralized workforce (Case 5-B) and an EXXON-assisted subdivision (proposed action, Case 5-A) have been assumed appropriate. The proposed action and alternative have been chosen in keeping with the CEQ guidelines and allow for a "worst-case analysis". This "worst-case analysis" brackets impacts in that opposite, extreme situations, i.e., maximizing projected impacts (e.g., transportation) to Eureka versus maximizing project impacts to other communities, can be evaluated. The actual housing development scenario would lie somewhere between the two alternatives identified.

   (In order to avoid undesirable speculative purchase of real estate and disruption of existing communities in the Mt. Hope area, care has been taken to avoid showing potential locations of subdivision sites. This omission does not affect the ability to perform a worst-case transportation impact analyses).

   - <u>Details of Proposed Permanent Housing</u>. Under the proposed action, EXXON would assist in the development of a subdivision. The subdivision housing would be available on a

free choice basis to employees. The subdivision may be located near the mine/process plant or the Town of Eureka. For worst-case transportation impact assessment purposes, it has been assumed that the subdivision would be located near the Town of Eureka.

This subdivision would require approximately 150 acres of land (200 acres if the 415 unit RV park previously discussed is included). Private ownership of the land required has been assumed. Consistent with county requirements, the new subdivision would include adequate parkland dedication and improvements (approximately 16 acres of parkland).

- Details of the Decentralized Workforce Housing Scenario. Under this alternative, the decentralized workforce housing scenario, it has been assumed that non-local workers would distribute themselves among the existing communities of Eureka, Carlin and Elko as fits their individual desires. For the purposes of impact analysis, the distribution of the non-local permanent workforce (total 525 employees) has been assumed to be the following: 356 employees locating with the Town of Eureka and vicinity, 128 employees locating in Elko City, and nearby 41 employees residing in Carlin. This alternative does not involve consideration of an EXXON-assisted subdivision.

5. To conduct the proposed mine development, EXXON has proposed a FLPMA land sale of 2,450 acres. The lands proposed for sale are outlined on Figure 1-6. Total land acreage under eventual EXXON control would total 8,900 acres (8,700 acres in the Mt. Hope project site study area, 200 acres of residential land (Table 3-2)). The portion of lands not immediately purchased by FLPMA sale (within the Mt. Hope area (8,700 - 2,450 equalling 6,250 acres) would be acquired as appropriate (e.g., via provisions of the 1872 General Mining Law, FLPMA, etc.).

Mt. Hope Molybdenum Project

Table 3-2 Areal Extent of Major Mt. Hope Project Components (Acres)

Components	4-A	4-B	4-C
Tailings Pond	3,460	5,650	2,170
Pit	700	700	700
Non-Mineralized Material Storage Areas	2,400	2,400	2,400
Evaporation Pond	165	165	165
Plant Site and Auxiliaries	100	100	100
Subdivision Site	200	200	200
Site Access Road 1/	30	30	30
Spacing Acreage	1,845	150	150
Total	8,900	9,395	5,915

1/ Exclusive of access roads paralleling rights-of-way.

Source: EXXON Minerals Company

One alternative component to the proposed action, tailings pond site selection (i.e., 4-A, 4-B or 4-C), would directly affect the EXXON proposal of land purchase by FLPMA sale. The possible selection of either alternate, 4-B or 4-C, would effectively negate the objective of the proposed land acquisition of 2,450 near the Mt. Hope mine pit and would transfer the need for such acquisition to the land encompassed by either alternate, 4-B or 4-C. In the event that the preferred tailings pond site 4-A was determined not acceptable for final land sales recommendation, EXXON has stated that its intent would be to gain land use rights (via FLPMA or 1872 General Mining Laws) of the Mt. Hope area illustrated on Figure 1-7 and the area encompassed by either of the eventual tailings pond selected. As such, selection of tailings pond Alternate 4-B would result in a total acreage control of approximately 9,395 acres (3,745 acres at Mt. Hope (Figure 1-7) and 5,650 acres at tailings pond Alternate 4-B). Final selection of tailngs pond Alternate 4-C would result in an EXXON controlled area of approximately 5,915 acres (3,745 acres at Mt. Hope and 2,170 acres at the tailings pond Alternate 4-C site) (Table 3-2). However, although total land acreage dedicated to the project development can be defined, the specific manner in which such land would be acquired, i.e., mining claim development, FLPMA land sale, or mixture thereof, cannot be accurately identified at this time. Such an identification would require a definitive assessment as to mineral potential within the area to be purchased as at this time. Federal policy requires that mining claims be forfeited prior to land purchase, an action which EXXON would not be prepared to be committal about without proper documentation of nonmineralization. Without specific acreages proposed for purchase, an assumption defining the sale as being zero (0) acres within either tailings pond Alternate 4-B or tailings pond Alternate 4-C areas has been determined appropriate. Thus, under Alternates 4-B and 4-C, FLPMA land purchase would equate to 100 acres - the land required for process plant development. All remaining land (9,050 acres in Alternate 4-B, 5,550 acres in Alternate 4-C) would be acquired by future enactment of the provisions of FLPMA or the 1872 General Mining Laws.

6. Relative to visual resource impacts, the proposed action would result in topographic alterations in the following areas and in the amount of land acreages shown.

Mine Pit	700 acres
Non-Mineralized Material Storage Areas (2)	2,400 acres
Tailings Pond 4-A	3,460 acres
State Route Relocation	67 acres

The excavation of 120,000 tons of rock per day (30,000 ore tons) would, over the life-of-mine period, result in a pit development with high and low walls of approximately 3,600 and 2,300 feet high. Distance across the pit would be approximately 6,900 feet.

The non-mineralized material storage areas would be developed in a bench-like manner with approximately 46 million tons (21 million cubic yards assuming no expansion) of overburden material. Bench crest elevations would differ by 330 to 900 feet (100 to 200 meters) at the southern and northern material storage areas, respectively.

Tailings pond dam 4-A would crest at an elevation of 6,447 feet, a 397-foot height. Tailings material behind the dam would correspondingly fill to elevation.

State Route 278 relocation would require alignment within an area of severely limiting topography, as proposed. The alignment proposed has not been surveyed, as such, exact topographic alterations have not been proposed.

Approximately 200 acres of land could be topographically impacted by the proposed development of an employee subdivision. The impacts associated wtih the subdivision development relative to topography/geology were not evaluated because of the uncertainty of eventual subdivision siting location. Based on the land use reviews conducted, however, lands suitable for development without topographic alteration (and the costs associated with such) are of sufficient quantity so as to justify preclusion of potential significance to topography/geology.

7. Tailings Pond Alternate 4-B (Diamond Valley) and 4-C (Kobeh Valley) would be constructed so as to have ultimate dam crest elevations of 5,922 and 6,619 feet, respectively. (Dam heights of 78 and 249 feet, respectively). Tailings material behind (or within as at 4-B) the dam(s) would correspondingly fill to elevation.

8. Upon cessation of mining, the mine pit and non-mineralized material storage areas would not be reclaimed, all other mine areas would be reclaimed. The topographic effect of tailings pond development would, however, remain after project cessation.

9. The topographic alterations of highway relocation would be conducted in accordance with Nevada Department of Transportation standards regarding cut and fill requirements, particularly stabilization. Additionally, it was assumed that the proposed realignment best suits topography as presently existing, specifically the maximum utilization of natural topography to allow minimal cut and fill operations.

Several specific assumptions related to project plans and used in the evaluation and analysis of potential resource impacts are discussed in the following sections. It should be noted that details concerning anticipated topographic impacts and thereby visual resource impacts are also presented in Technical Report No.2; details concerning the types of equipment and operations serving as noise generation sources are presented in Technical Report No.1, and; details concerning the rate of population growth are presented in Technical Report No.9.

3.3 Land Ownership

The following discusses significant impacts associated with land use and implementing the proposed and alternative actions. Each alternative discussion is initiated with a summary of impact which is followed by a detailed review of analysis.

3.3.1 Proposed Action

The proposed action, involving a FLPMA land sale of up to 2,450 acres with an additional acquisition of 6,450 acres (Total = 8,900 acres) for the purposes of private industry (EXXON) mineral extraction and processing, has been analyzed as to land ownership character as described in the following.

3.3.1.1 Land Ownership Impact Summary

The proposed action would directly impact the manner in which the affected lands have been historically managed and used. If implemented, the proposed action would immediately result in the transition of present day management practices of predominantly open grazing lands to that of mineral resource extraction. Of the approximately 8,900 acres that would be controlled by EXXON, virtually all of the area would be actively used for the mine/process plant operation or environmental and safety maintenance buffers.

An additional direct impact to area land use patterns would involve the development of the proposed action housing subdivision. The conversion of approximately 150 acres of land may be considered on a worst-case basis to involve the total transposition of land use goals or present patterns. The provision near Eureka of a 50-acre recreational vehicle park to support construction housing needs may be considered a direct impact, on a worst-case basis, due to the potential that the site location may also require transposition of land use goals.

Impact assessment regarding land use alterations, on a worst-case basis, primarily would assume that development of the subdivision and temporary housing totalling approximately 200 acres requires the acquisition of county-owned lands. This worst-case scenario would be based on the fact that county-owned lands represent the smallest entity ownership position (less than 0.1 percent of total acreage in the county). Implementation of the proposed action, resulting in a 10 percent reduction in county-owned lands, would be considered a significant change with potential for benefits and detriments.

However, based on land ownership reviews and availability of lands, it is not expected that singular acquisition of county lands for housing would be required. The major criterion of assessment would then involve the availability of lands throughout the study region. Land use change would, therefore, be considered in terms of net type lands remaining available for agriculture, recreation, etc. In such terms, the proposed action would be considered insignificant.

Implementation of the proposed action would not conflict with any presently existing county land use controls, or with federal policy regarding FLPMA land sales. As noted in the following section, the proposed land sale has been determined to satisfy the criteria of evaluation set forth by FLPMA.

3.3.1.2 Impact Assessment Details - Land Ownership

The proposed action represents an activity that would directly involve two primary factors in land use: 1) direct change in land ownership (e.g., public land transposed to private land, and; 2) the method of land aquisition.

The direct change in land ownership responsibility would not present a significant quantitative change in the lands managed and under control of the federal government. Total lands so transposed would equal much less than even one percent of the public lands in the region and as such would not be significant.

The method of land acquisition was infrequently a subject of concern during the EIS scoping process. However, a review of FLPMA criteria must be conducted in order that compliance with FLPMA provisions be attained and the appropriateness and/or possibility of making public lands available for sale can be determined.

The Act (FLPMA) specifically sets forth several criteria of statutory basis for a sale of public lands. Among the criteria established, the requirement that a land use plan be prepared pursuant to Section 202 of the Act and that one or more of three specific suitability criteria be satisfied is part of the BLM decision-making process.

On June 24, 1983, the Battle Mountain District of BLM published for public review and comment a draft resource management plan and environmental impact statement for the Shoshone-Eureka Resource Area. The public comment period on the draft closed on September 21, 1983. A final RMP/EIS is being prepared and will be published in 1984. The purpose of the plan is to guide the long-term management policy of the resource area and to set forth specific actions to resolve management issues.

Early in its planning efforts, the BLM identified five issues where management efforts needed to be concentrated. These five issues were carried forth and analyzed in the Draft Shoshone-Eureka RMP/EIS. One of these issues concerned the need for land tenure adjustment within the resource area to satisfy long-term land use management goals. As cited in the Shoshone-Eureka RMP/EIS, the following objectives were defined as being fulfilled by the land tenure adjustments recommended in the proposed resource management plan.

"Objectives. To increase opportunities for economic development by moderately increasing the amount of privately-owned land within the resource area consistent with the other objectives of this alternative.

To adjust the land tenure pattern through disposals requested by private landowners consistent with the other objectives of the alternative.

Management Actions. 1) Identify a pool of approximately 104,959 acres of public land which meet preliminary disposal criteria. Disposal would meet needs for recreation or other public purposes, community expansion, economic development, agriculture, and for the creation of blocked-ownership patterns which would result in improved land management. Livestock grazing preference would be adjusted as appropriate subsequent to actual land disposal. The number of acres identified in the disposal pool by resource conflict area are 27,398 in the Eureka RCA, ed. The legal descriptions of the lands identified for disposal by alternative

are available upon request from the Battle Mountain District Office.

2) Dispose of up to 13,440 acres (not included in pool under number 1) of public land suitable for agricultural purposes within 15 years in Grass, Kobeh, Antelope, Monitor, Fish Creek, Little Smoky, Big Smoky, Upper Reese River, and Smith Creek valleys".

In its impact analysis the BLM stated:

"Land Ownership. 1. An estimated 58,440 acres of public land would be transferred to other ownership (ed. 17,985 in Eureka RCA). Based upon professional judgement, the identification of a 104,959-acre pool of lands would result in the estimated disposal of approximately 45,000 acres over a 15-year period. This disposal would result in the following percentage changes in land tenure within the resource area. Public land would decrease from 91.5 percent to 90.5 percent. Private land would increase from 8.5 percent to 9.5 percent.

Disposal would meet some community expansion needs, eliminate isolated parcels in agricultural areas, and would provide some lands for commercial and industrial development.

Disposal would result in the transfer, to private ownership, within 15 years, of up to 13,440 acres (not included in the disposal pool) of public land suitable for agriculture. This represents a 0.3 percent reduction in the number of acres of public lands within the resource area..."

"Economic Impacts. 2. The disposal of 45,000 acres of public land would not significantly alter the tax base of Lander and Eureka counties. The successful disposal of

45,000 acres of public land over a 15-year period would alter the tax base of Lander and Eureka counties, but not to a significant degree. Based on estimated fair market value applied to potential highest and best use, these lands are valued at $11,076,375. Assuming assessed valuation at 35 percent of full cash value, these lands would add $3.9 million, or approximately 4 percent, to the total assessed valuation ($91.7 million) of the two counties.

Social Impacts. 1. No significant change (except for minerals) in local resident access to public land resources would occur. Public land as a portion of the resource area land base would decrease from approximately 91.5 percent to 90.2 percent. The size of the reduction from land disposal is not sufficient to alter the present supply-demand relationship. Livestock permittees would continue to have access to public grazing lands, except where public land is transferred to other ownership. In this case, disposal of public land would effectively reduce the amount of forage available to be licensed for livestock use..."

In a review of the No Action alternative and component of land sale, the BLM stated as impacts the following:

"Land Ownership. 1. No public lands would be transferred to other ownership. Not changing the present pattern of land ownership within the resource area would result in 1) lands being made available for lease, with no offer to purchase, to satisfy needs for recreation or public purposes near communities; 2) lands not being made available through disposal authorities to meet residential, commercial, industrial or agricultural needs; and 3) lands not being disposed of which are isolated or difficult to manage.

Economic Impacts. 1. Land sales would not result in significant economic impacts. Expression of interest for transfer of

public lands to other ownership would continue to be considered on a case-by-case basis. However, without the encouragement of the specific management proposals provided under the other alternatives, it is expected that the present pattern of land ownership within the resource area would remain substantially the same. The potential for economic development, or the possibility of realizing benefits that might derive from more efficient use of the land would be diminished".

The suitability criteria of FLMPA allow that, if as a result of land use planning it can be demonstrated that: 1) a tract is difficult, uneconomic or unsuitable for federal management; 2) is no longer required for the purpose for which it was acquired; or 3) its disposal will serve important public objectives, a sale of public land may be implemented. This EIS effort has taken into consideration and analysis the applicability, if any, of all three criteria.

Manageability. The Mt. Hope lands do not presently involve or require management efforts considered excessive in nature. The Act intended that lands being considered for FLPMA sale under this criteria would be those lands represented by such management difficulty as being checkerboarded with private ownership, etc.

Acquisition Purpose. Again, the Act did not intend that the Mt. Hope acreage represent the types of lands available under the acquisition clause. Such lands would truthfully be characterized as perhaps, in example, private land bought by the U.S. for government office developments which may in subsequent years be subject to budget cut suspension.

Public Objectives. With respect to the criterion of serving important public objectives (Criteria 3), the action of making lands available has been determined to definitively satisfy FLPMA requirements and thusly, the need for such action is present. This determination is based on a review of the land-use goals identified in the Shoshone-Eureka RMP/EIS and the intent, as demonstrated by the Congressional Record, of the Act itself.

The public objectives most affected by a BLM decision to approve or disapprove the proposed action are little affected by the method of land acquisition, either FLPMA sale or by 1872 Mining Law Provision. A limited advantage of a FLPMA sale has been determined to be economic and environmental in nature; specifically the fiscal benefits to federal and local entities and the necessity to analyze and formulate environmental mitigation plans, including the interests of public review.

The fiscal benefits identified with implementation of the proposed action are derived as a result of differences between the effects of the General Mining Law of 1872 and a FLPMA land sale. Under the provisions of the General Mining Law of 1872, no monies (excepting nominal patent fees) are generated as the public land is transferred to private ownership during the process of claim patenting. A FLPMA land sale requires that the sale be conducted, in most cases, on the basis of competitive bidding. To afford the preference rights authorized by the bill, the Secretary of Interior may grant a right of first refusal or make any other appropriate modification of competitive bidding. The end result of the competitive bidding is represented by a dollar per acre amount to be paid in purchase to the Department of Interior. If past experience holds true based on the sale of similar type lands, a FLPMA land sale of the Mt. Hope lands could conservatively be expected, at fair market price, to generate in excess of $245,000 ($100 per acre). Competitive bidding could result in significantly greater costs per acre, with EXXON perhaps topping the highest competitive bid if right to first refusal was granted by the Secretary.

The monies generated by a FLPMA land sale would be available for public lands improvement and administration. In addition to the fiscal benefits derived directly from a FLPMA land sale, certain tax monies and related economic advantages are affected by the implementation of a land sale or development of the land through the provisions of the General Mining Law of 1872. First, taxes in the form of ad valorem property taxes would be immediately assessable to EXXON in the event of a FLPMA sale. Under the conditions of claim patenting, the ad valorem property taxes could not be assessed on the land value since ownership would remain public until such time that patenting was completed. The annual increment of ad valorem

taxes assessable to the land value (not property such as mill, equipment, machines, etc.) would approximate $900 at a land sale price of one quarter million dollars (correspondingly, a land sale equal to one million dollars would generage approximately 3,500 dollars annually). The assessable tax base would accrue to EXXON immediately upon land purchase, regardless of eventual mine development timing. The monies so generated would be directly distributed to Eureka County, Town and School District.

It may additionally be noted that EXXON need not take the claims to patent before initiating mine operations. In a worst-case analysis, EXXON could proceed with life-of-mine operations without claim patenting (or FLPMA sale) which would result in up to $4,500 or more (175,000 if land purchased at one million dollars) not being assessed over the first 50 years of project life.

The environmental benefits that a FLPMA land sale provides can best be illustrated by the EIS which would not necessarily be prepared and reviewed were EXXON to proceed first with lode and millsite patenting and then with initiation of mine/process plant development. In such an event, federal agency actions would be limited to determining right-of-way approval or disapproval which in total might not encompass on EIS scope effort. A Plan of Operation would also not necessarily be prepared or require an EIS as once patented, action upon the lands would not require BLM decision-making. As such, the decision to proceed with EIS preparation for the proposed FLPMA sale has assured that an instrument of review imput for mitigation planning and environmental protection on a project comprehensive basis is provided in an open-forum manner early in the project and in an orderly way.

3.3.2 Alternatives

Land use impacts associated with implementation of rights-of-way and tailings ponds alternatives were assessed similarily to the proposed action implementation. It should be noted that two types of alternatives regarding land ownership have been formulated. The two types of alternatives may be described as direct and indirect alternatives of the proposed action. Specifically, Alternative 1-B is a direct alternative to the proposed action

of land purchase and entails a decision basis for no land sale under FLPMA. The second type of alternative is characterized by the results of implementing a tailings pond site selection other than that proposed (i.e., tailings pond 4-A). Selection of either tailings pond 4-B or 4-C would negate the need for land purchase as proposed by EXXON (2,450 acres, Figure 1-6). As such, it has been determined that the total land purchased in the event of alternate tailings pond selection would, on a worst-case basis, equal only 100 acres in the area of the process plant facility. While EXXON may eventually acquire lands in the vicinity of the alternate tailings pond site selected, the present-day policy requirement that mining claims be forfeited prior to a land sale precludes an EXXON determination of what lands might be sought for purchase as adequate mineralization data (for demonstration of non-mineralization) is not available.

Land Ownership Impact Summary

Implementation of Alternate 1-B would, upon final patenting under the provisions of the General Mining Law of 1872, result in private ownership similar to that described for the proposed action. Until such time that the affected lands were patented, ownership would be retained by the public and would require management obligations. In as much as a land tenure adjustment has been determined to be beneficial to public goals, implementation of the Alternate 1-B has been determined adverse.

Alternative 2 (power line routings 2-B and 2-C) or Alternative 3 (water lines 3-B and 3-C) components were determined not to present significant impacts if emplemented as lands would remain in public ownership and is not proposed otherwise.

Implementation of tailings pond Alternate 4-B would result in the permanent loss of 5,650 acres of grazing lands at the tailings pond site, an increase of 2,192 acres (63 percent more than that associated with tailings pond 4-A) from the proposed action. Additionally, the use of Alternate 4-B would increase the zone of land use impact as project facilities would span a greater area. Total differential in lands affected would equal 9,395 acres, an increase of approximately 5.6 percent from that of the proposed action

(8,900 acres). The increased transposition of lands and area of influence was considered a direct impact. Implementation of tailings pond Alternate 4-C would result in an impact significance similar to the proposed action, excepting the increase of influence zone described for Alternate 4-B. Total land affected by Alternate 4-B would total 5,915 acres, however, a significant reduction in affected acreage (33.5 percent less).

For reasons similar to those described for the proposed action, the purchase of 100 acres under either Alternate 4-A or 4-B was not determined to represent a significant impact or contradiction to FLPMA policy. The sale of 100 acres versus 2,450 acres would, however represent a diminished benefit to the public in monetary terms. Additionally, the lands of Alternatives 4-B and 4-C have not been identified for potential disposal in either the Eureka County General Plan or the Shoshone-Eureka RMP/EIS (U.S.D.I., 1983).

Quantitative evaluation of Alternate 5-B, Decentralized Workforce, in terms of land ownership cannot be definitively conducted at this time due to the unknown eventual location of housing. Assuming random and disassociated housing (no subdivision) would require acreage in excess of that needed for centralized area utilization, the demand upon available private lands could be exptected to be greater than that estimated for the proposed action.

3.3.3 No Action

Land ownership would be retained by public enitity. Management obligations would remain as at present. In as much as it was determined that land tenure adjustments were identified on a preliminary basis to be in the public interests (see preceding sections), failure to proceed in a manner representing those public interests would represent a loss of benefit.

3.4 Land Use Patterns

The following details the assessment of impacts (primarily intrinsic changes from present day use to mining related use) resultant of implementing

the proposed action and alternatives upon the land use character of the Mt. Hope site study area.

3.4.1 Proposed Action

Native Americans. In accordance with the National Historic Preservation Act, as applicable to consideration of Native Americans in project evaluation, contact with various Indian groups in Nevada was initiated to assure appropriate impact analysis. The proposed action would not entail use of Indian reservation lands nor would the proposed action occur within proximity of such lands. However, the Duckwater Shoshone Tribe in its response to project requests for information of interest has stated that the Western Shoshone and United States are presently in litigation with regard to the disposition of lands including the project area lands (see Appendix 8-A).

Agricultural Lands. Agricultural areas in the Mt. Hope region are restricted to Diamond and Kobeh valleys. Although proposed power and pipeline routings will cross in part such lands, the primary mine/process plant site does not include cropland areas. Power line routing, which presently includes 3.8 miles traversing agricultural land, may be affected by agricultural use patterns (e.g., avoidance of circular irrigation systems). As such, no significant impacts were identified relative to agricultural land use. Analyses have included effects of atmospheric emissions (Technical Report No.3); groundwater impacts associated with ore processing (Technical Report No.4) and soil erosion impacts (Technical Report No.5).

Grazing Lands. Short and long-term losses of rangeland would be the same for the proposed action. The loss of government controlled rangeland would involve 358-438 AUMs since the Mt. Hope site would go to private ownership. This loss of AUMs would directly affect two permittees in the Romano and Roberts Mountain Allotments whose livestock presently utilize the Mt. Hope site. The Romano Allotment would lose 311-381 AUMs and the Roberts Mountain Allotment would lose 47-57 AUMs.

Recreation. The impacts upon recreational resources of the affected area would be both adverse and beneficial. While county, school and private

recreational facilities appear adequate to accommodate increased use and might benefit from such an increase, overcrowding and excess demand would be expected. Until the establishment of subdivision recreation facilities, the adverse effects upon recreational facility capabilities and use would be significant. Significance of impact would, however, decrease substantially thereafter assuming both that the recreational facilities planned are implemented and that economic/social influx would proceed normally to include population sensitive growth (churches, social clubs, etc.). Non-facility recreation (e.g., hunting, fishing, sightseeing) would be significantly, adversely impacted. Excess demand for hunting and fishing privileges would result in participant and non-participant displeasure due to overcrowding and probable prohibition of activity for some. Increased sightseeing, including associated off-road vehicle use and campground use would also result in perceptions of recreational pleasure being decreased. Physical disturbance of available lands would be expected to increase as a result of greater use, some of which would require more management activity if the status quo were to remain intact (e.g., increased grounds maintenance, Toiyabe National Forest).

Timber Products and Pine Nut Gatherings. The proposed action of removing up to 8,900 acres from public access would significantly affect the availability of such lands for timbering and pine nut gathering on a local criteria basis. The annual estimated harvest of 300 to 500 Christmas trees (6 to 10% of region harvest) would be removed and/or made inaccessible to the public. The associated impact would be adverse, limited to local significance.

3.4.2 Alternatives

This section describes the impacts upon existing land use patterns assuming implementation of the alternative actions of power line, water line, tailings pond and workforce housing. It should be noted that of the alternatives considered, tailings pond site selection represents the major component of variable impact significance from the proposed action. No alternatives are reasonably defineable for the mine pit and non-mineralized material storage areas.

Native Americans. The impacts upon Native Americans of alternative implementation (all alternates) would be identical to that described for the proposed action (i.e., no impact identified to date).

Agricultural Lands. Implementation of Alternative 1-B would result in no direct impact to agricultural lands.

Alternative power line rights-of-way 2-B and 2-C cross agricultural lands (approximately 4.0 and 6.2 miles, respectively). Power line routing may be changed to avoid circular irrigation practices. Water line Alternates 2-B and 2-C would present no significant impacts in terms of agricultural land use. Alternate water line 2-C would, hoever, conflict with ongoing seeding activity by the BLM. Tailings pond Alternates 4-B and 4-C do not presently include agricultural uses. While potential for such use exists, particularly at tailings pond Alternate 4-B in Diamond Valley, a determination of no significant impact was warranted based on present-day conditions.

Alternate 5-B involving random housing location would, upon implementation, present circumstances that would be expected to result in an increased demand for land use pattern change within private lands (e.g., agricultural to residential). Due to the agricultural importance of Diamond Valley managed lands, a worst-case assessment of lands taken out of production by the implementation of Alternate 5-B would warrant a determination of adverse impact, significant on a local and regional basis.

Grazing Lands. Under Alternative 1-B, land development under the provision of the General Mining Law of 1872, the short- and long-term losses of government controlled AUMs would be the same as the proposed action: 311-381 AUMs in the Romano Allotment and 47-57 in the Roberts Mountain Allotment.

The short- and long-term losses for power line Alternates 2-B and 2-C would be the same. The short-term loss would be the minor disturbance during installation of the power lines and road. The long-term loss would be the vegetation lost on the road. Both Alternates, 2-B and 2-C, have an insignificant effect on grazing.

The short- and long-term losses for the water line Alternates 3-B and 3-C would be the same. The short-term loss would be the minor disturbance during installation of the water line and road. The long-term loss would be the vegetation lost on the road. Alternative 3-B would have an insignificant effect on grazing, however, Alternative 3-C would interfere with the livestock operation on Roberts Creek seedings (Nos.1 and 2) and Nichols seeding.

Short- and long-term losses (equal for short-term and long-term in each case) for tailings pond Alternatives 4-B (9395) and 4-C (5915) would occur. The loss of 63-77 AUMs for the Romano Allotment and 76-94 AUMs for the Roberts Mountain Allotment would be permanent. The reduction in acreage affected within the Mt. Hope site area (from 8,900 acres to 3,745, Figure 1-7) would result in a lessening of grazing land loss in that area (proposed action loss of 358-438 AUMs within the 8,900 acre tract). Loss of AUMs within the 3,745 acre tract would total approximately 105 to 132 AUMs, resulting in a total loss of 168 to 209 AUMs for the Alternate tailings pond 4-B case and 181 to 226 AUMs for the Alternate tailings pond 4-C case.

The short- and long-term losses associated with Alternate 5-B, Decentralized Workforce, cannot be readily quantified due to the unknown locations eventually selected for residency. Due to the unlikelihood of residing on BLM land, it may be assumed that most, if not all, residency will be established on private lands without government controlled AUM allotments.

Recreation. Implementation of Alternates 1-B, 2-B and 2-C, 3-B and 4-B would result in impacts to recreational resources similar to that identified for the proposed action. Alternate water line 3-C would significantly impact a regionally important sage grouse strutting area. Alternate 4-C would further increase recreational area (hunting) utilization by the project.

Alternate 5-B, Decentralized Workforce, would represent the greatest relative potential for recreational resource impacts. Provision of recreational facilities or park acreage is not planned in the Alternate 5-B case. Significantly adverse impacts to area resources would be expected. Mitigation of impact would be limited primarily to public entity response (e.g., county, school, U.S.F.S. facility expansions or additions). Overcrowding and system

degradation would be expected to be severe with a five to ten year gap between demand and private enterprise developments. Nonfacility recreational impacts would be lessened by implementation of Alternate 5-B with demand being distributed between Elko and Eureka counties.

Timber Products and Pine Nut Gathering. Excepting Alternate 4-C, impacts to timber product resources and pine nut gathering would be similar for the identified alternatives as described for proposed action. Alternate 4-C would result in the additional loss of land (up to 1620 acres) presently available for such use.

3.4.3 No Action

Native Americans. Implementation of the no action alternative would result in impacts similar to the proposed action or component alternatives. Land ownership litigation would remain unaffected by implementation or non-implementation of the Mt. Hope project.

Agricultural Lands. Implementation of the no action alternative would preclude project impacts, if any, to agricultural lands.

Grazing Lands. Implementation of the no action alternative would result in no numerical or ownership effects upon government controlled AUM allotments as the no action alternative assumes no implementation of the project.

Recreation. Both adverse and beneficial impacts to area recreational resources would not be realized under the no action alternative. Whereas adverse impacts under the proposed action case were determined short-term in duration and extent with long-term benefits being realized thereafter, implementation of the no action alternative would preclude the Mt. Hope specific impetus to further develop recreational resources. The preclusion of such development was determined insignificant, however, in that the status quo appears adequate for population satisfaction.

Non-facility recreational resource impacts would be beneficially precluded under the no action alternative as the cause of impact, increased

population with associated use demands, would not occur on a project specific basis.

Timber Products and Pine Nut Gathering. Implementation of the no action alternative would result in no net impact upon timber product resources and pine nut gathering potential.

3.5 Visual Resources Impact Analysis

3.5.1 Introduction

As previously stated, EXXON Minerals Company plans to develop an open pit molybdenum mine and process facility (Mt. Hope) on public lands on which the company has located mining claims under various general mining laws, approximately 25 miles northwest of the town of Eureka in Eureka County, Nevada.

In order to construct and operate the Mt. Hope Project, EXXON Minerals would affect the visual composition of approximately 8,900 acres of land. The major proposed action components are as follows:

Tailings Pond	3,460 acres
Mining Pit	700 acres
Non-mineralized Mineral Storage Area	2,400 acres
Evaporation Pond	165 acres
Plant Site and Auxiliaries	100 acres
Subdivision Site	200 acres
Site Access Road[1]	30 acres
Spacing Acreage	1,845 acres
	8,900 acres

1/ Exclusive of access roads paralleling right-of-ways.

In addition to the above acreages, additional areas will be disturbed visually for the construction of the proposed water line, power line, highway relocation, and the upgrading of the Machacek Power Substation. Alternate corridor routes have been proposed for the water and power lines.

The BLM has implemented a visual inventory and evaluation process to provide for a systematic inter-disciplinary approach to the management of visual resources values on public lands. The Visual Resource Management (VRM) system inventories existing landscape character and assigns visual management classification based on the combination of visual qualities, visual sensitivities, and visual distances in the landscape.

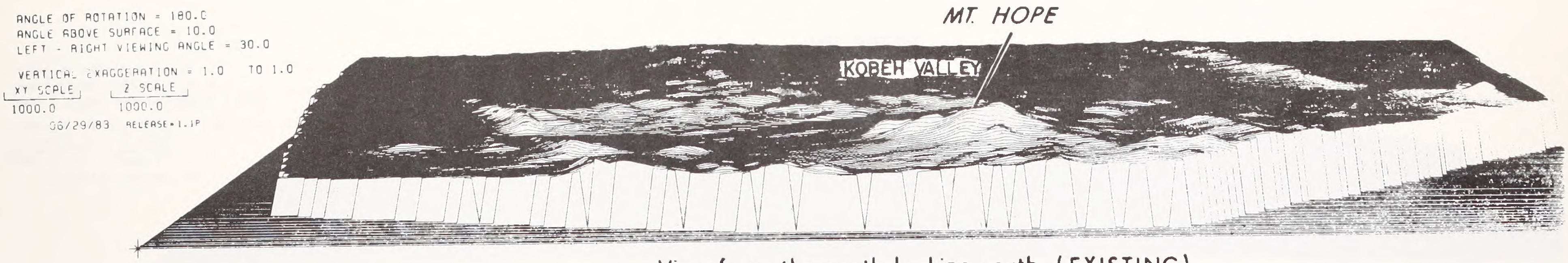
The affected environment is identified as the area which might potentially be influenced by the proposed actions and/or alternatives. The study area for the Mt. Hope Project is defined by a generalized viewshed analysis which identifies all land areas from which the proposed facilities would be visible.

The accompanying computer-generated sketches (Figures 3-2 through 3-5) demonstrate the topography of the study area looking south, north, east and west.

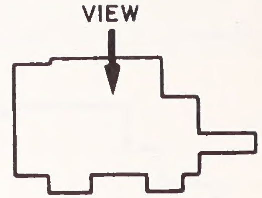
3.5.2 Regional Overview

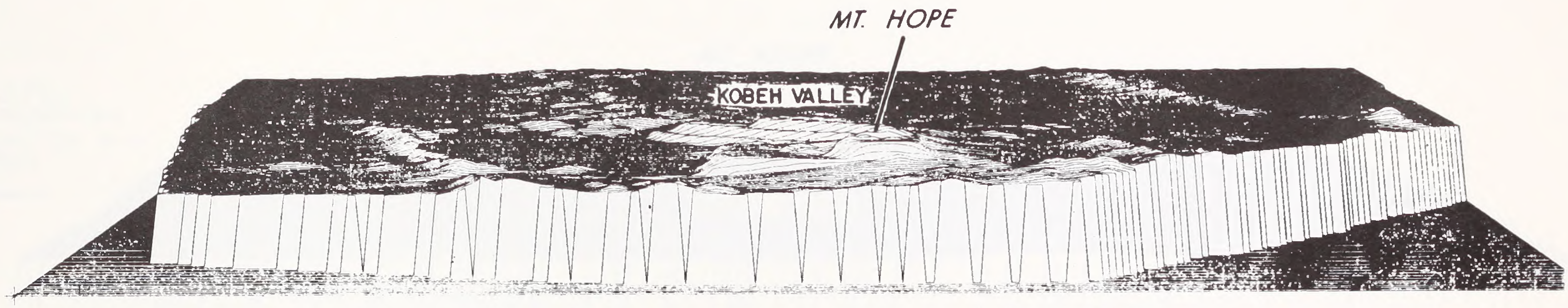
The study area's visual characteristics, qualities, and management classes were refined by the Bureau of Land Management, Battle Mountain District Office, Battle Mountain, Nevada. Scenery qualities were determined using basin and range physiographic province as the standard of comparison.

The quality of views within Kobeh Valley, Diamond Valley and Mt. Hope Mountain area vary from extremely high in the mountain area to mediocre within parts of the valley floor (WRC, review assessment). The quality of views is mediocre starting in the valley, to medium in the foothills and uplifts area to high in the escarpment and mountainous areas.



View from the north looking south (EXISTING)





TOPO WITH TAILINGS POND

View from the north looking south (PROPOSED)

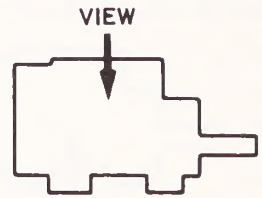
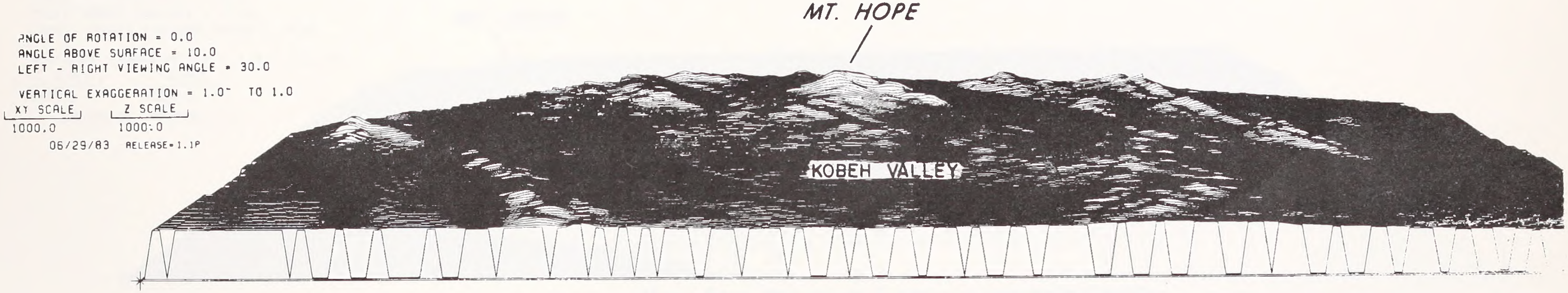
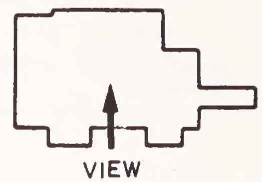


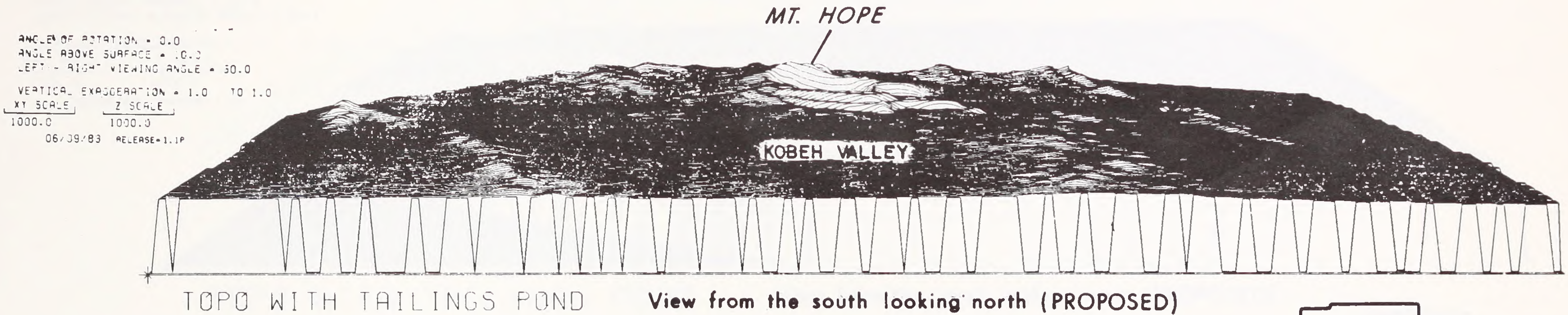
FIG. 3-2

PERSPECTIVE OF MT. HOPE EXISTING TOPOGRAPHY
VS. PROPOSED ACTION TOPOGRAPHY
(Includes Mine Pit, Tailings Pond, Non-Mineralized Storage Areas)



View from the south looking north (EXISTING)





View from the south looking north (PROPOSED)

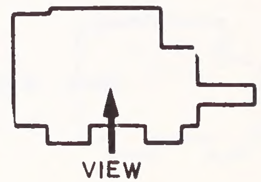


FIG. 3-3

PERSPECTIVE OF MT. HOPE EXISTING TOPOGRAPHY
VS. PROPOSED ACTION TOPOGRAPHY
(Includes Mine Pit, Tailings Pond, Non-Mineralized Storage Areas)

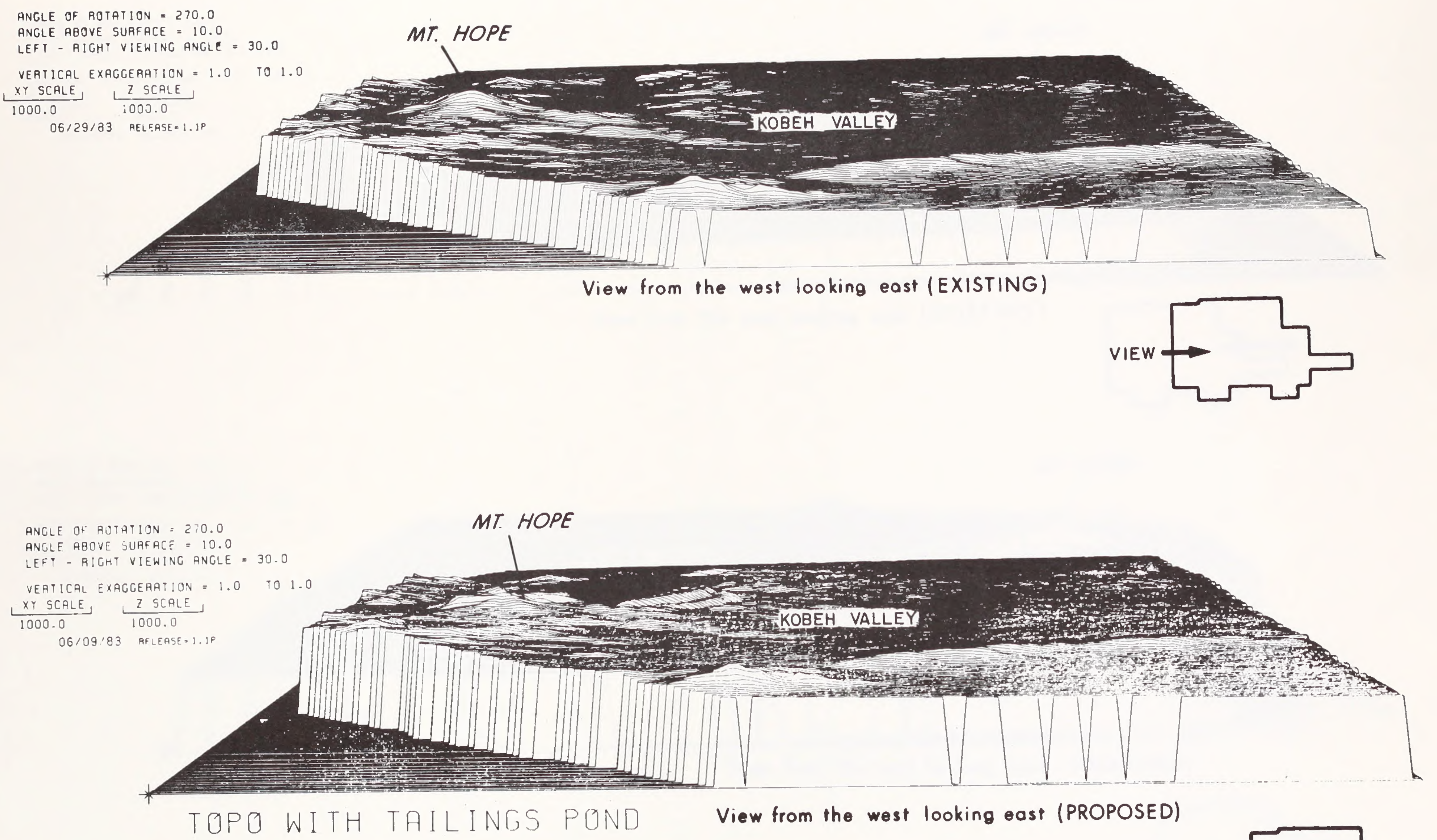
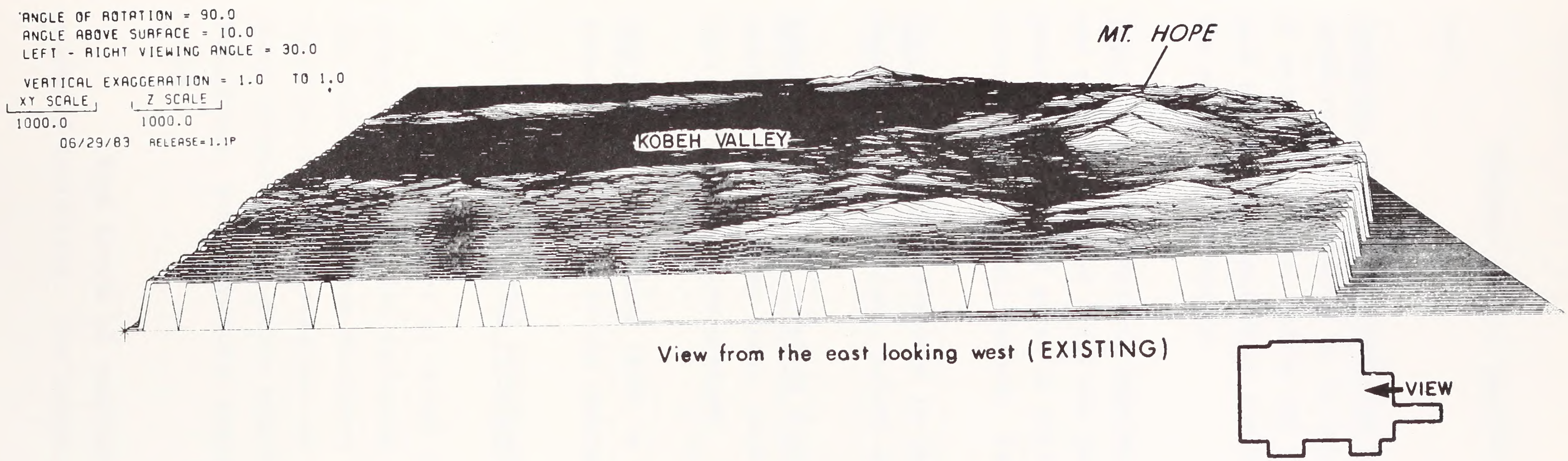
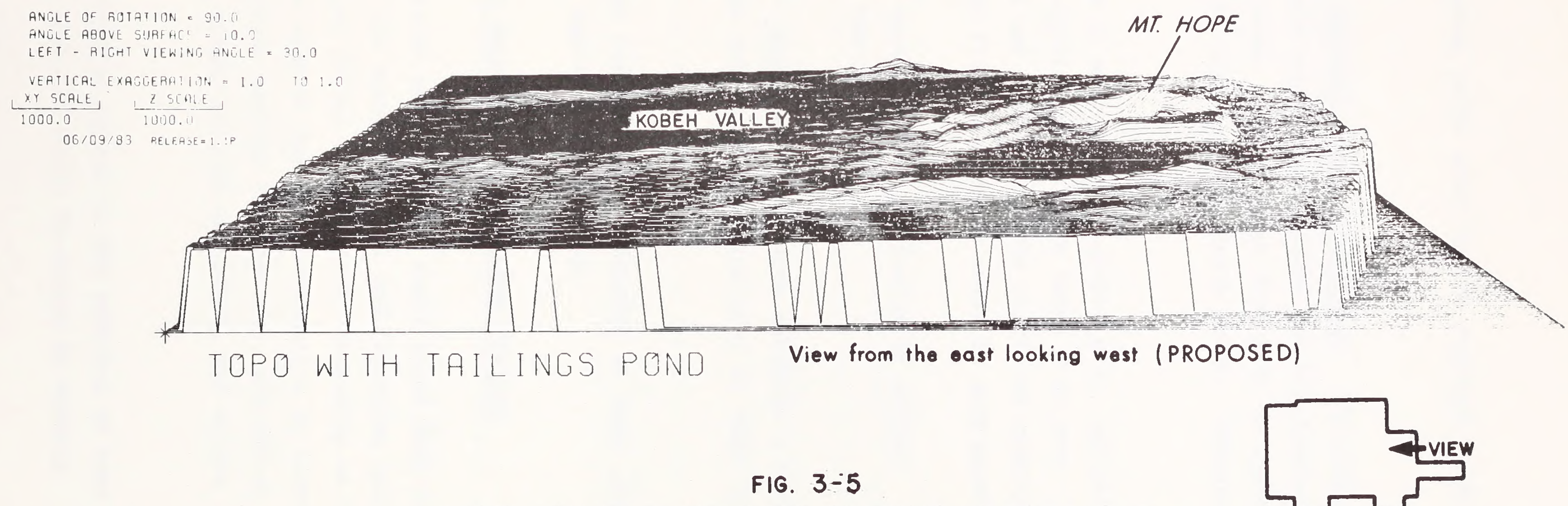


FIG. 3-4
PERSPECTIVE OF MT. HOPE EXISTING TOPOGRAPHY
VS. PROPOSED ACTION TOPOGRAPHY
(Includes Mine Pit, Tailings Pond, Non-Mineralized Storage Areas)



View from the east looking west (EXISTING)



View from the east looking west (PROPOSED)

FIG. 3-5

PERSPECTIVE OF MT. HOPE EXISTING TOPOGRAPHY VS. PROPOSED ACTION TOPOGRAPHY

(Includes Mine Pit, Tailings Pond, Non-Mineralized Storage Areas)

Various scenery quality rating units exist in the regional study area.

Landscape Character - Mountains and Foothill Areas - Landforms. The mountain landforms are expressed by an unusually high summit (2,564 meters) consisting of prominent cliffs, spires and outcrops. Colors range from grey to light brown, dark browns, pink and white within the rock and bare earth areas. Textures are predominantly coarse.

Vegetation. The mountain vegetation is predominantly pinyon pine, juniper and sage. Forms and lines are not significant. Colors range from deep greens, yellows and greys to yellows and reds within the scattered riparian areas during the fall season. Valley floor vegetation color is grey-green.

Structures. The structures in this mountain area and foothills exhibit significant form, lines, colors and textures.

Landscape Character - Valley Floor - Landforms. This area exhibits a flat to gently rolling valley floor, with the colors ranging from grey to light green. Most textures are fine grained.

Vegetation. The valley floor is fine textured with a blanket of sage, grey-green in color with little contrast against native soils.

3.5.3 General Cultural Modification Caused by the Proposed Project

Major types of visual cultural modifications would occur with the proposed project. The influence of the visual cultural modifications upon the existing landscape character would differ significantly depending on the location of the modification and the time of day the modification is viewed. Major positive or negative modifications include the mine pit, processing facilities, ponds, material storage areas, utility corridors, and access roads.

High levels of contrast would be caused by the addition of most proposed facilities. Low levels of contrast would be caused by utility

corridors and access roads. Site, lines, texture, and color contrast would be the major areas of modifications. The high level of contrast would occur as the proposed facilities are viewed against the mountain areas. Moderate to low levels of contrast would occur on the valley floor. The major exception on the valley floor would be the inclusion of the power line transmission towers. The general mining activity, tailings disposal areas, and pond areas would cause a high level of contrast wherever they occur. Dissimiliar colors and textures would be the cause of major contrast.

Landform. Landforms of the project area consist of the Mt. Hope mountain which is characterized by prominent rock cliffs and uplift areas. The foothills are gently rolling, with sloping outwash areas, the valley floors are extremely flat to gentle slopes.

Vegetation, Color and Water. Minimal variety of vegetation and color exists within the valley floors. Moderate variety of vegetation and color is apparent within the mountain areas. Natural water bodies of water are non-existent within the study area. Visual water exists in the form of run-off during and shortly after seasonal rains.

Cultural Modification. The study area is almost free from aesthetically undesirable influences. However, the Diamond Valley contains some levels of modification in the form of road and power lines/substations, and numerous dirt and gravel roads.

Viewer Sensitivity. A WRC landscape architect made judgements regarding attitudes of residents and visitors toward visual changes in the study area. While significant visual changes would occur, residents may view the change as progress and welcome the limited visual changes upon the existing landforms.

Distance Zones. The distance zones varies from close proximity (foreground) of the mining/process facility. Middle background proximities dominate the distance zones for the proposed project. Several small areas of seldom seen zones exist in the study area.

Visual Resource Management Classes. Five VRM classes have been established by the BLM to provide guidance in ascertaining the degree of modification to the landscape affected by proposed management activities.

Scenic Quality. Two VRM classes exist in the immediate study area. These include: 1) Class III, within the Mt. Hope Mountain and foothills area south of the proposed project and along the eastern and western sides of Garden Valley to the north; 2) Class IV, the valley floor adjacent to and south of the Mt. Hope project. A visual resource management classes map may be found in Chapter 2.0, Section 2.2.7 (Figure 2-3).

3.5.4 Summary

Two visual resource management classes and two scenery quality rating units were identified for the study area. The classes and units correspond to the contiguous portion of the landscape that displays similar landforms, color and texture.

Values (A, B or C) were assigned to each unit based upon scenic quality of the unit in relation to other units in the area. The mountain area, north of the proposed project, and the foothill area south of the project are classified as Class III, with a value rating of "B" for the mountain and a "C" value for the foothill area. The valley floor is assigned a Class IV rating with a value of "C".

Two VRM classes (III and IV) exist in the study area. The mine/ processing complex and half the length of the proposed water line corridor would be located in the VRM Class III areas. The proposed power line routing and proposed highway relocation would occur in the VRM Class IV area.

Proposed alternatives for the water line corridor, power line routing and tailings pond locations would occur in VRM Class IV areas.

VRM - Environmental Consequences

Evaluation Criteria and Assumptions. The Bureau of Land Management's Visual Resource Management System is used to assess the visual consequences of the proposed action and alternatives. The degree to which the mine/process complex, transmission line, water corridor adversely affect the visual quality of the landscape depends upon the amount of visual contrast that is created by the activity in relation to the existing landscape character. The amount of contrast between the proposed activity and the existing landscape character can be measured by separating the landscape into its major features (landform, vegetation and structure), and then predicting the magnitude of change in contrast of each of the basic visual elements (form, line, color and texture) to each of the features. The assessment of amounts of contrast caused by the proposals indicates the severity of impact and serves as a guide in the effort to reduce visual impacts.

It is assumed that the construction, use, and removal of the mine/process complex, transmission line, water corridor would be undertaken and completed as indicated elsewhere in the EIS. It is further assumed that standard operating procedures include conscious efforts to minimize and localize disruption of the landscape.

VRM Effects of the Proposed Action and Alternatives

Mine/Process Complex. The proposed site plan for the mine/processing complex includes the following facilities: open pit mine; mill facilities; waste disposal areas; tailings dam and pond; soils stockpile; and various auxiliary facilities, including offices, storage buildings, roads, water and power line distribution systems. Estimated surface disturbances for the various subcomponents of the complex total 8,900 acres. The general purpose of the above facilities relates directly to the flow of molybdenum extraction and concentration process.

Impacts. Visual impacts caused by the mine/process complex are defined through the BLM visual contrast rating system. The analysis is performed from a point three miles southeast of the site. The entire area of the

proposed project is classified as VRM Class III. It is estimated that air-borne particulates generated at the complex would not be visible from the Town of Eureka. However, structures and landforms would be slightly visible during morning hours out to 25 miles (Eureka, Nevada).

Visual Contrasts/Landforms. It is estimated that form and color, related contrasts caused by the proposed mine, tailings disposal dam, material and waste storage would be strong in form and color. Line and texture related contrasts are considered moderate in line and texture. The maximum contrasts are caused by the color of the earth and vegetation on the visible landforms in relation to the surrounding landscape.

Visual Contrasts/Vegetation. Line, color and texture related contrasts caused by modification of vegetation are considered moderate. Form related constrasts are moderate. The maximum contrast would be caused by the color for the proposed facility in relation to the surrounding landscape.

Visual Contrasts/Structures. It is estimated that form and texture related contrasts caused by the proposed structures would be moderate in form and texture. Line and color contrasts would be moderate. The total contrast is estimated to be moderate. The maximum contrasts would be caused by the form of the proposed structures (block) in relation to the forms of the surrounding landscape (planar and angular).

Mitigation Measures/Landform. Establishment of grass and shrub vegetation on visible slopes would reduce color contrasts substantially. Grading of earth-forms to conform to surrounding terrain would further reduce form and line related contrasts. Terraces should be graded evenly to reduce shade patterns and resultant tonal contrasts. Proper grading would reduce form, line, color, and texture related contrast to a total acceptable landform contrast.

Mitigation Measured/Vegetation. The establishment of native grasses and shrubs, on new landform and disturbed areas would reduce color and texture further to an acceptable level of contrast.

Unavoidable Adverse Impacts. Visual impacts caused by the tailings and waste disposal areas and the mine pit in a viewing range of nearer than one mile are unavoidable. However, the distance to the nearest public road is approximately five miles (straight line). The establishment of vegetation would not significantly mitigate form or line related impacts in near distance views, but most views would be from a distance of five miles or greater. The presence of dust from processing and inter-site road travel would cause moderate visual impacts.

230 KV-69 KV Transmission Line. Power to the Mt. Hope site would be provided by Mount Wheeler Power, Inc. (MWP) located in Ely, Nevada. MWP would make the formal application for rights-of-way to BLM. Power would be provided by a 69-kilovolt (KV) line (construction phase) and a 230 KV line for operation. Both lines would originate at the Machacek Power Substation located near Eureka. Construction of the power line is dependent on the upgrading of the Machacek Station and is not addressed in this section since it will occur with or without the proposed action. If power substation is upgrading prior to construction, the 230 KV line would be constructed initially and the need for the 69 KV line would be eliminated. Detailed information pertinent to the power line may be found in Appendix 8-B.

The following assumptions are applicable for the rights-of-way (proposed and alternate routings):

1. 125 feet of width, and an area of 3.5 acres/mile of route would be disturbed for the 22-mile line (77 acres total).

2. The number of towers (179) with two supports would remain the same, whatever route is chosen.

3. The area radius around each pole would not be maintained free of native vegetation.

4. 15 foot wide access road, parallel and a mile and a half from Highway 278 would be constructed and maintained for maintenance activities and routine patrol.

The terrain on which the power facilities would be constructed are relatively flat areas with few, if any, large cut and fill sections.

The color of the transmission line towers and associated structures would be medium to dark brown in color. The towers would be placed approximately 650 feet apart (8 towers/mile).

Impacts. Visual impacts caused by the proposed 230KV-69KV power line are analyzed in two segments. Segment one would occur from Machacek Substation to a distance of five miles northwest of the substation. Segment two would occur from a point five miles north of the substation to the proposed project site.

Segment one of the power line would parallel Highway 278, east and west side of the road, and would cross the highway once. Segment two would parallel Highway 278, west side, at a distance of approximately one and one-half miles and would be nearly invisible from most of Route 278.

The proposed power line would cross approximately 19 miles of BLM VRM Class IV area, and three miles of BLM VRM Class III area.

Visual Contrasts/Landform. Line and color related contrasts which would be caused by proposed construction and maintenance roads are estimated to be weak in line and color contrast. Little form or texture related contrasts would be apparent.

Visual Contrasts/Vegetation. Line, color and texture related contrast caused by the proposed action caused to the disturbance of vegetation along the proposed route are estimated to be weak in line, color and texture. Little form related contrast would be apparent.

Visual Contrast/Structures. Form and line related contrasts caused by the proposed structures are estimated to be moderate in form and line. Color contrast would be strong. No texture related contrast would be apparent. total contrast caused by the proposed structures would be moderate. However, it is estimated that impacts would be significant in the area of Highway 278 power line crossings, due to the high level of visibility.

Recommended Mitigation Measures. The revegetation of disturbed areas would provide adequate mitigation of visual contrasts related to ground areas along the proposed transmission line route. The planned distance between poles would decrease visibility and resultant visual contrast. The use of water borne preservatives and light colored wood, would further reduce color contrast from strong to weak.

Visual Contrasts/Landform - All Options. Line related contrasts which would be casued by the proposed construction and maintenance roads are estimated to be moderate. Color related contrasts are expected to be weak. No form or texture contrast would be apparent. The total contrast for proposed landforms falls within BLM's Class III, and Class IV restrictions.

Visual Contrast/Vegetation - All Options. Line, color and texture related contrast caused by the disturbance of vegetation would be weak. No form related contrasts would be apparent. Total contrast for proposed vegetation falls within BLM's Class III and IV restrictions.

Unavoidable Adverse Impacts. Unavoidable visual impacts would not be caused by the proposed 230KV-69KV transmission line, if recommended mitigation measures are implemented.

The strong color-related contrast caused by the use of creosoted fir poles and cross braces would cause significant visual impacts for an area approximately 22 miles long, all of which would be within 1.5 miles of Route 278. The visual impacts would be mitigated by using western red cedar poles and cross braces. These poles would reduce the contrast to a level which falls within BLM Class III and Class IV restrictions.

There would be significant adverse visual impacts at the mine/processing site. The landform contrast associated with construction of the mine/processing complex would exceed the allowable contrast values for a VRM Class III area. The construction of the transmission line would represent a visual intrusion for those individuals and visitors traveling Highway 278 through Diamond Valley. However, the contrast values would be within restrictions for BLM Class III and IV areas and, after mitigation, would not signifi-

cantly affect visual resources.

Although there are two routes (proposed and alternative route) the routes are basically the same, differing only on location to the west or east side of Highway 278. Distance for both proposed and alternative is approximately the same. The proposed route would cross Highway 278 once. The alternate power line location would cross Highway 278 three times. Both line locations would cross the same classes of BLM VRM areas for approximately the same distance.

Water Line Rights-of Way. The proposed mine project would require fresh water in the amount of approximately 5,400 gallons per minute (7.8 million gallons per day) including actual usage and unpumped reserves. Pump tests at the Kobeh test site indicate all required water can be obtained from this area. (Section 2.5.2, EIR). The proposed location of the four well field at the Kobeh test site and approximate routing would require 11 miles of 24" diameter pipe installed below grade. A 15-foot wide gravel road would be constructed and maintained parallel to the pipeline. The well field would contain four wells on a one-mile spacing. A maximum 100-foot wide corridor would be disturbed during construction. Each well site would disturb approximately 1/4 acre (1 acre total). The disturbed area at each well site would be graveled and maintained. Detailed information relevant to the water line may be found in Appendix 8-B.

Impacts. Visual impacts caused by the water line rights-of-way are defined through the BLM Visual Contrast Rating System. The analysis is performed from Highway 278. The proposed water line corridor would be approximately six miles west of Highway 278 and would be almost parallel to Highway 278.

Visual Contrasts/Landforms. Since the 24-inch pipeline would be placed below grade, the pipeline would not be visible after construction is complete. The well apparatus and service road would be very slightly to seldom seen. Based on existing topography, the service road would follow existing contours and involve little cut and fill. After construction the rights-of-way and service road would not be readily visible from Highway 278.

Visual Contrasts/Vegetation. Line, color and texture related contrast caused by the modification of vegetation are considered to be very weak to seldom

seen from Highway 278. The maximum contrast would be caused by the color of the exposed earth and could only be perceived from the air at a low level of flight. This contrast would not be visible after reclamation is completed using native shrubs and forbs.

Visual Contrast/Structures. It is estimated that the form, texture line and texture contrast would be very slightly to seldom seen. Only four water well heads and associated apparatus, along with the graveled service would be above grade. The six-mile distance to Highway 278 and existing topography precludes this proposed action from being readily visible.

Summary

Proposed Actions. The proposed actions and alternative options would influence two separate VRM classes within the study area. The VRM class map (Figure 2-3) and Figures 1-2 and 1-4 allow by comparison the location of proposed actions and alternative options with respect to the VRM classes.

Mine/Process Complex. The construction of the mine process complex would impact the visual quality of the project area. It is estimated that the visual contrasts associated with construction of the mine pit, tailings dam, and pond, and material waste disposal areas at the mine/process complex would be significant. These proposed components would produce substantial changes to the existing topography and would be partially visible from as far as 25 miles southeast of the site (see Figures 3-2 through 3-5 for computer simulations of the existing and future topography at the project site). As indicated previously, the mine/process site is located in a Class III area; the form and color contrast associated with the new landforms would exceed the allowable contrast for Class III areas.

The major cause of the predicted visual contrast would be differences in the color of the pit, tailings, and waste disposal areas relative to the surrounding vegetation, and differences in their shape and form relative to existing topography. Establishment of vegetation on these areas and grading to blend with existing contours would reduce this visual impact to lower acceptable levels. However, as indicated in section two, the worst-case

analysis indicates that some revegetation areas would fail. Therefore, the visual impacts caused by construction of primary and support facilities for the mine/process complex would be significant.

Impact Summary for Mine/Process Complex

	(Landforms)	(Vegetation)	(Structures)
Visual Contrasts	Strong	Moderate	Moderate

230KV-69KV Transmission Line - Including Alternative. Construction of the transmission line would represent a visual intrusion for those individuals transiting the immediate area, but it would not significantly affect the visual resource quality of the entire project area. There would be color contrast associated with the dark brown transmission towers superimposed upon the dominantly grey-green landscape on the valley floor. The transmission line would be most visible from the Machacek Power Substation to a 0.5 miles northwest of the substation. It would be less visible from five miles to the mine/process complex. As indicated previously, the transmission line would cross 19 miles of Class IV and three miles of Class III VRM areas. The visual contrast impacts associated with the transmission line would be within the allowable limit of contrast for Class III and IV areas. However, visual impacts caused by the proposed structures are estimated to be significant in the total length of the power line transmission corridor due to the discordance of color. This would represent a significant impact for an approximate 22 mile distance.

Water Line Rights-of-Way - Including Alternative. Construction of the water line, well field and gravel service road would not present a significant visual intrusion for those living or traveling through the project area. The proposed action would be most visible from the air at a low flight level. Visibility from Highway 278 would be slightly to seldom seen. The water rights-of-way would cross approximately nine miles of Class IV area and two miles of Class III area. The visual contrast impacts associated with the water line rights-of-way would be within the allowable limits of contrast for Class III and IV areas. Line, form, color and texture contrast are estimated to be very weak.

3.6 Transportation Impacts Analysis

3.6.1 Theory of Traffic Forecasting

The amount of travel depends on population. It depends on the location of the population in regards to work areas, recreation areas and supply areas. Traffic is defined as travel by motor vehicles as measured by the number of vehicles on a particular segment of road. Methods to forecast future traffic are well established in the highway planning process. Underlying the ability to forecast future traffic volumes and patterns for an area is the ability to first understand the relationship between travel and land use, and secondly to accurately forecast population, economic activity, and land use.

Theory claims there is an order in human behavior which translates into there is a reason for a trip. This orderliness allows for predictability. Two methods are commonly used for traffic forecasting: mechanical, which examines and defines past trends of traffic growth and projects them into the future assuming it will follow the same pattern; and analytical, which attempts to determine the factors that influence travel patterns, and then express them in a mathematical relationship. In this case the mechanical method was used to estimate future traffic without the project and the analytical method was used to estimate the Mt. Hope related traffic.

3.6.2 Method of Analysis

Forecasting information was obtained directly from the Nevada Department of Highways and from their previous published documents. They utilize vehicle counters at existing locations throughout the system to determine their base data. They then project by examining population and travel trends typically in two year increments.

Highway segments were prepared based on the location of these stations and can be described as follows:

Station 38= US-50 West of the 278N and US-50 Intersection

Station 40= 278N North of the 278N and US-50 Intersection

Station 47= US-50 North of Eureka Central Business District (CBD) and before the 278N-US 50 Intersection

Station 51= US-50 South of Eureka CBD

3.6.3 Worst-Case Analysis

Three analyses were run all using a worst-case scenario. Table 3-3 is the Worst-Case situation because it lumps all the population for maximum construction and operation between the Eureka CBD and the N278 US-50 intersection. The assumptions utilized are stated in the bottom of the table. No workers were located in Elko or Carlin.

Table 3-4 utilizes Alternate 5-A assumptions which put some employment in Elko and Carlin and places the Work Camp at Mt. Hope. Maximum analyses include an AM peak hour assumption which utilizes 1.5 trips per family unit and does not include any shift work situations.

Table 3-5 displays the Alternate 5-B proposal which does not include any EXXON subdivision but rather allows the employment to go into local areas.

3.6.4 Summary

All the above information was allocated to highway segments and summed for entry into Table 3-6 Traffic Data. The 1982 and 1987 data were obtained directly from the Nevada Department of Transportation. The other data was obtained from various documents. The worst-case took the highest traffic figure irrespective of years and added the appropriate segment load to it.

The estimated hourly capacity were based on known highway estimates for highways similarly constructed. Inner town area segments were raised to 1,800 to reflect improved shoulder and maintenance programs typical of town areas.

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Table 3-3 Traffic Analysis Mt. Hope - Worst-Case

AM Peak Hour - Travel to Work Trip Origin	A	B	Add to Existing Baseline C
A=Eur CBD-S	361	208	208
B=Bet CBD-Int	0	806	465
C=SR278 Int-Min	0	0	423
D=US 50 Int+W	0	0	0
E=Carlin-Mine	0	0	0
F=US 50 S of Eur	0	0	0
Total Trips	361	1,014	1,096

Assumptions	EMP	Max Work	Add Trips
Total	1,410		
Construction	940	940	
EXXON	470	157	
Work Camp in C	423	423	0
RV Park in B	423	289	212
Subdiv. in B	259	177	130
Subtotal B	682	465	341
Eureka in A	305	208	153
Elko in E	0	0	0
Total	1,410	1,097	494

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Table 3-4 Traffic Analysis Mt. Hope - Alternative 5-A

AM Peak Hour - Travel to Work			Add to Existing Baseline	
Trip Origin	A	B	C	E
A=Eur CBD-S	201	114	114	0
B=Bet CBD-Int	0	741	419	0
C=SR278 Int-Min	0	0	423	0
D=US 50 Int+W	0	0	0	0
E=Carlin-Mine	0	0	0	91
F=US 50 S of Eur	0	0	0	0
Total Trips	201	855	956	91

Assumptions	EMP	Max Work	Add Trips
Total	1,321		
Construction	851	851	
EXXON	470	157	
Work Camp in C	423	423	0
RV Park in B	385	251	193
Subdiv. in B	259	169	130
Subtotal B	644	419	322
Eureka in A	175	114	88
Elk and Car in E	79	51	40
Total	1,321	1,008	449

Table 3-5 Traffic Analysis Mt. Hope - Alternative 5-B

AM Peak Hour - Travel to Work			Add to Existing Baseline	
Trip Origin	A	B	C	E
A=Eur CBD-S	350	198	198	0
B=Bet CBD-Int	0	442	250	0
C=SR278 Int-Min	0	0	423	0
D=US 50 Int+W	0	0	0	0
E=Carlin-Mine	0	0	0	232
F=US 50 S of Eur	0	0	0	0
Total Trips	350	640	871	232

Assumptions	EMP	Max Work	Add Trips
Total	1,315		
Construction	845	845	
EXXON	470	157	
Work Camp in C	423	423	0
RV Park in B	385	250	193
Subdiv. in B	0	0	0
Subtotal B	385	250	193
Eureka in A	305	198	153
Elk and Car in E	202	131	101
Total	1,315	1,002	446

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Table 3-6 Mt. Hope Traffic Data

	US 50 W Sta 38 (D)	SR 278 N Sta 40 (C)	US 50 N Eur CBD (A)	US 50 W CBD Sta 47 (B)
Baseline	680	200	1,680	1,455
1982 *	570	280	1,600	
1985 Proj.	660	315		1,655
1987 Proj. *	741	218	1,831	1,586
Worst-Case	741	1,319	2,192	2,600
Alt. 5-A	741	1,179	2,032	2,441
Alt. 5-B	741	1,089	2,181	2,226
			Estimated Hourly Capacity	
Baseline	1,500	1,500	1,800	1,800
			Volume/Capacity Ratio	
Baseline	0.45	0.13	0.93	0.81
1982	0.38	0.19	0.89	ND
1985 Proj.	0.44	0.21	ND	0.92
1987 Proj.	0.49	0.15	1.02	0.88
Worst Case	0.49	0.88	1.22	1.41
Alt. 5-A	0.49	0.78	1.13	1.36
Alt. 5-B	0.49	0.73	1.21	1.24

Ref. Table 2, 3, 4 Add Maximum to Maximum Projection
Ref * Telecon Nevada Department of Transportation.

ND - No Data

Volume/Capacity ratios were then determined to show highway utilization during worst case scenarios. It is important to note that segment B from the Eureka CBD to the 278N-US-50 Intersection is shown to overload as is Segment A (Eureka CBD) without the project.

All segments inside the Eureka town area show overload with the CBD showing the maximum. This is typical of a project such as this and is short lived ending with the completion of the construction phase. Towns can plan and receive special attention for these projects but should especially try to relieve CBD area overloads which will remain overloaded due to normal area growth.

3.7 Noise Impact Analysis

3.7.1 Introduction

The construction and operation of the EXXON-Mt. Hope project will produce two potentially major sources of noise and two minor sources of noise.

Major sources:

1) Mine blasting
2) Mine haulage and plant operation

Minor sources:

1) Construction activities
2) Traffic to and from site

The purpose of this analysis is to establish on a general level the impacts associated with these noise sources and suggest mitigation methods where applicable.

The effects of noise can generally be classified into three categories:

1) Subjective effects such as annoyance and nuisance.
2) Interference with activities such as speech communications, work, education, and sleep.

3) Physiological effects such as loss of hearing and stress related problems including nervousness and high blood pressure.

3.7.2 Maximum Expected Noise Impacts

Blasting Noise. Of all the noise sources reviewed on this project, vibrations from blasting have the greatest potential for disturbance. Blasting will take place on a one time per day basis. It will consist of some 1,000 lb. charges being detonated at an average depth of 45 feet. Typically 40 charges will be fired using a standard delay.

The best available noise level information on such blasting comes from Siskind and Summers (1974), "Blast Noise Standards and Instrumentation". Due to the low frequencies of such air blasts the usual A,B,C scales do not adequately indicate potential damage to hearing or buildings even though they are not readily "audible". However, maximum levels used in this case are presented in dBA for ease of review and because they are found to be most conservative.

The major receptor areas are Eureka at 25 miles distance to the south and highway State Route 278 which comes as close as 3.5 miles northeast of the mine area (see Figure 1-3). Additional receptors include two ranches, one located 8.5 miles to the northeast (Romano Ranch) and one 6.25 miles to the southwest (Roberts Creek Ranch) of Mt. Hope.

The total charge weight is 40,000 lbs. and assumes a worst-case of 128 dBA reading at 1,500 ft. maximum based on data presented by Siskind and Summers (1974). Attenuation was reviewed and a conservative figure was developed to account for absorption from hard ground. No attenuation due to atmospheric conditions was utilized. Topographical features were also not used due to their difficulty to model but they could reduce the values presented significantly. If a factor for brush and trees is used the effects drop rapidly.

The Mt. Hope estimates indicate no significant noise problems at either the highway (<53 dBA) and no effect (all absorbed) within 20 miles and well before the Town of Eureka. The standards for impulsive sound levels

suggest a 145 dBA limit for a one time per 24-hour period or a 125 dBA for a 100 time per 24-hour period (see Table 3-7). Normal mitigation efforts should result in an even lower actual dBA level. Note that continuous sound levels must meet much more stringent standards.

Mine/Process Operation Noise Impacts. A combination of noise sources are included in this analysis of mine/process noise impacts. The major mine sources are drilling, loading and hauling. Noise levels ranging from 93-107 dBA at the operator's position are not uncommon (U.S. Dept. of Labor, 1981).

Mineral process plants which are designed to crush, clean, process and size minerals also emit noise primarily from crushers, screens, mills and other processes. Typical noise from these sources runs from 90-118 dBA (U.S. Dept. of Labor, 1981).

To estimate these impacts a worst-case level of 118 dBA was used and the emission point centered at the crusher location. Estimates at various distances were developed using conservative attenuation factors and using a spherical divergence analysis. Property line levels or State Route 278 levels calculated to be less than 66 dBA (see Table 3-8). This is below the 70 dBA which is the commonly accepted outdoor noise level. Actual noise levels would be expected to be far lower due to atmospheric ground attenuation. Topographic barriers would also lessen the impact.

Other Potential Noise Impacts. Other impacts associated with this project consist of two major types:

1) Construction activities, this includes construction of the water way, the power lines, the state highway relocation, the dam site, the mine site, and the processing site; and

2) Highway traffic noises due to increased travel to and from the project during and after construction.

Table 3-7 Typical Noise Standards

Agency	Category	dBA	Duration
FHWA	Parklands	60	
	Recreational	70	
	Developed Lands	75	
	In Public Buildings	55	
Continuous Sound Levels that Pose Threat to Health & Welfare			
		90	24 Hrs
		93	12 Hrs
		96	6 Hrs
		99	3 Hrs
		102	1.5 Hrs
		105	45 Mins
		108	22 Mins
Impulsive Sound Levels that Pose Threat to Health & Welfare			
		145	1/24 Hrs
		135	10/24 Hrs
		125	100/24 Hrs

Source: U.S. Environmental Protection Agency (EPA), 1976 and 1978.

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Table 3-8 Mine/Process Operational Noise Estimates

Operation	Est dBA	Distance
Drilling	107	Operator Position
Dumping	101	Operator Position
Hauling	93	Operator Position
Dozers	102	Operator Position
Loaders	101	Operator Position
Shake outs	118	Operator Position
Crushers	107	Operator Position
Screen	103	Operator Position
Mills	100	Operator Position

Worst Case Analysis

Distance	dBA Measured/Calculated Spherical Divergence, No Attenuation	dBA Spherical Divergence Plus Ground Attenuation (6 dBa/1,000 ft.)
20 Feet	118	118
1 Mile	76	44.32
2 Miles	70	6.64
3 Miles	66	0
4 Miles	64	0
5 Miles	61	0
10 Miles	56	0
20 Miles	50	0
30 Miles	46	0

A brief analysis of construction activities indicated that levels to be expected from equipments utilized during construction would be well below the 70 dBA guidelines and of a temporary duration.

Likewise, increased traffic noise from traffic travelling to and from the project would effect the ambient noise levels only slightly due to the still low density of vehicles travelling on State Route 278 (205 vehicles per day; NDOT, 1983).

3.7.3 Noise Mitigation Measures

Blasting Mitigation Noise Measures. There are numerous practices in the mining industry which can minimize blasting noise levels. These practices will be used in this project and should result in reducing any impacts even below the levels projected in Table 3-9.

The primary mitigation measures are the following:

1. Minimize the size of the blast.
2. Minimize the frequency of blasting.
3. Use multiple delays.
4. Time blast to coincide with periods of high ambient noise.
5. Use audible warning devices before blast.
6. Consider weather conditions, especially wind direction and speed.
7. Consider temperature inversion.

Each of these measure can assist in keeping the overall impacts to a minimum. When combined they can be even more effective.

Mitigation Measures for Process/Operating. Once again a series of common sense measures can assist in reducing operating noise levels both around the plant and at the property boundaries.

1. Operate the noisiest equipment during the daytime.
2. Reduce night hauling as much as possible.
3. Maintain and lubricate equipment correctly.
4. Utilize sound screens in high noise areas.

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Table 3-9 Blast Noise Estimates

Charge In Lbs	No. of Blasts	Total Charge in Lbs	dBA at Distance 1,500 ft	2.0 mi	3.0 mi	3.5 mi	20.0 mi	25.0 mi
Mt. Hope Estimates			Spherical Divergence, No Attenuation					
1,000	40	40,000	128	111.0485	107.5267	106.1878	91.04855	89.11035
Mt. Hope Estimates, Spherical Divergence Plus 3dBA/100ft for Brush								
1,000	40	40,000	128	0	0	0	0	0
Mt. Hope Estimates, Spherical Divergence Plus 6dBA/1,000ft Ground Attenuation								
1,000	40	40,000	128	80.08855	61.08672	52.00779	0	

Source: Siskind and Summers, 1974.
Reethof, G. 1973.

CHAPTER 4.0
LIST OF REVIEWERS AND PREPARERS

4.1 U.S. Department of the Interior, Bureau of Land Management

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B.S. Biology, Washington College, MD;
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4.2 Consultants

ROBERT C. WYATT, Project Manager

B.S. in Biology, University of Miami
Post Graduate Study, Biology, University of Miami

Mt. Hope Project: Responsible for coordination of environmental discipline impact analyses (except cultural resources) and direction of the third party EIS scientific team; technical and regulatory (NEPA) oversight and management of EIS documentation; and liaison and coordination with the Bureau of Land Management (BLM) and EXXON.

Experience includes management and technical analyses of environmental impact studies involving surface and underground mines, nuclear and coal-fire electrical generating plants, petrochemical and mineral process facilities, and hazardous waste/nuclear disposal site regula-

tory analysis. Professional experience involving activity in 23 states, Mexico and Puerto Rico has included the technical critique and environmental discipline analysis of hydrology, air quality, chemical and mine engineering, terrestrial and aquatic biology, socioeconomics, land use, pollutant toxicity and regulatory compliance.

LESTER ALLEN KISH, Range Ecologist

B.S. in Fish & Wildlife Management, Montana State University
M.S. in Range Science, Montana State University

Mt. Hope Project: Technical analysis and field survey of project land vegetation, threatened and endangered species, and range conditions. Assisted in primary preparation and review of vegetational technical report including aerial photo interpretation (infra-red).

Experience includes professional activity as principal investigator/project leader on baseline and annual vegetation monitoring studies, range resource inventories, mapping and conflicts analysis of livestock grazing allotments. Professional experience has primarily involved analysis and assessment of mine operations in the western United States.

JEFFREY T. RYAN, Ecologist, Photo-interpreter

B.S. (associate) in Natural Sciences, University of Wisconsin Center System Marathon
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Mt. Hope Project: Responsible for infrared aerial photo interpretation of project land vegetation.

Experience includes eight years of aerial photo interpretation involving more than five million acres of land in the western and central United States. Project activity has emphasized environmental impact analyses for mining operations, including the determination of erosion condition classification via BLM soils surface factor criteria.

WILLIAM M. O'BRIEN, JR., Visual Analyst

B.S. in Landscape Architecture, Pennsylvania State University
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Mt. Hope Project: Responsible for visual response evaluation and impact assessment. Prepared technical report and impact section discussion for EIS documentation.

Professional experience includes review and evaluation of mining and reclamation plans, development of mitigative programs, project engineering and plans design. Has assisted in management and preparation of numerous environmental impact statements and EISs; analysis of overall environmental impacts, recreational, planning, esthetics and inventory of natural systems.

Experience has emphasized energy development projects, particularly mine operations, throughout the United States.

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B.S. in Pre-Med, Wayne State University, Detroit, Michigan
M.S. in Engineering, University of Washington, Seattle, Washington

Mt. Hope Project: Responsible for assisting in impact analysis related to air quality fugitive dust emissions, noise and transportation.

Mr. MacKenzie has over twenty years experience in environmental management with both the private and public sector. He is an expert in all aspects of regulatory compliance at U.S.E.P.A. and state levels. He has served as chairman of the Southwest Section of the Air Pollution Control Association (APCA) and as President of the Association of Local Air Pollution Control Officials (ALAPCO). He was for a number of years the Air Quality Manager for a large environmental consulting firm, and his project experience includes management of several large environmental projects. He has held the posts of chief environmental officer for the cities of Houston, Texas, and Fairbanks, Alaska. He is currently active in Houston on the Chamber of Commerce Environmental Committee and the Mayor's Environmental Task Force consulting on regulatory and air quality matters.

KEVIN P. MULLEN, Regulator/Environmental Analyst

B.S. in Pre-Med/Biology, Stonehill College, North Easton, Massachusetts
M.S. in Biology, Northeastern University, Boston, Massachusetts

Mt. Hope Project: Responsible for quality assurance in documentation of EIS technical reports.

Professional experience includes marine and tropical ecology/impact assessment and transfer of technology. His managerial/administrative experience includes environmental and planning studies for the petroleum, chemical, mining/metals and utilities industries. He has contributed to baseline and impact assessments related to nuclear and fossil-fuel power plants, offshore energy, coastal oil fields, port development, and agri-business. He has eight years international experience in coastal resources planning and development, higher education and formulation of environmental regulations.

RANDALL K. BUSH, Geologist/Data Analyst

B.S. in Geology, University of Houston

Mt. Hope Project: Assisted in the preparation and data abstraction required for EIS technical reporting. Coordinated EIS documentation relevant to mapping and quality assurance.

Professional experience includes technical writing and regulatory compliance documentation for numerous coal and mineral mines; technical critique of topographic and geologic data and support documentation; and land use analysis (physical environmental factors relevant to engineering planning).

LAURIE A. PEARCE, Documentation Coordinator

B.A. in Business Management, Houston Community College (in progress)

Mt. Hope Project: Responsible for overall supervision and quality assurance of data reproduction, impact documentation quality and oversight review archiving.

Professional experience includes document supervision and quality assurance program maintenance/design for several mining related environmental assessment reports and Office of Surface Mining permit applications.

CASHION CALLAWAY, Administrative Coordinator

Mt. Hope Project: Served as Project Manager and production editor for the Class II Archaeological Survey in addition to providing project and administrative management for the Class III Archaeological Survey.

Cashion Callaway has eight years archaeological experience in the history and prehistory of the Great Basin and desert west. During this time, Callaway has served on the technical staffs of Archaeological Services, Nevada State Museum; the Archaeological Survey, University of Nevada/Reno; the California Department of Parks and Recreation, Division of Archaeology; and Henningson, Durham and Richardson, Ecosciences Division. While she possesses a variety of technical skills appropriate to the field and laboratory, Callaway brings to her work a special interest in cultural resources contract management. On a day-to-day basis, Callaway functions as IMR's projects manager and contract administrator. Callaway, together with Robert Elston, organized the firm of IMR in 1979.

CHAPTER 5.0
LAND USE, TRANSPORTATION AND NOISE GLOSSARY

A-weighted Sound Level. A number, expressed in decibels, followed by an identifier dBA. To describe noise environments and to assess impact on noise-sensitive areas, a frequency weighting measure that stimulated the human perceptions is customarily selected. A-weighted ratings of noise sources, which reflect the human ear's reduced sensitivity to low frequencies, have been found to correlate well with human perceptions of the annoying aspects of noise, particularly with traffic noise sources. Consequently, A-weighted noise levels, described in decibels-A or dBA, are the values cited by such federal agencies as the Federal Highway Administration (FHWA) in its noise criteria and in a majority of state and municipal noise ordinances (National Institute of Municipal Law Enforcement Officers and Environmental Protection Agency 1975).

Aggregate soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as crumbs, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali sacaton. A coarse perennial grass of the southwestern U.S., used for pasture and hay in alkaline-saline regions.

Alkaline soil. A soil with a high degree of alkalinity or with a high exchangeable sodium content, or both. Specifically, any soil that has a pH value >7.0.

Allotment. An area designated for the use of a prescribed number and kind of livestock under one plan of management. (BLM)

Alluvial fan. A fan-shaped deposit of sand, gravel and fine material dropped by a stream where its gradient lessens abruptly. Usually found at the base of highland terrain in arid regions.

Alluvium. A general term for all detrital material deposited or in transit by streams, including gravel, sand, silt, clay and all variations and mixtures of these.

Alpine. Of or pertaining to high mountains, particularly above the timberline elevation.

Animal unit month = AUM. The quantity of forage required by one mature cow (1,000 lb.), one horse or five sheep for one month.

Ambient Noise. The totality of noise in a given place and time.

Aquifer. A formation, group of formations, or part of a formation that is water bearing.

Available water capacity. (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed

as inches of water per inch of soil and by the soil profile as follows:

Very low.................................less than 2.5 inches
Low......................................2.5 to 5 inches
Moderate.................................5 to 7.5 inches
High.....................................more than 7.5 inches

Bajada. The joining together of many alluvial fans to make a continuous apron-like feature of sediment.

Brushland. Land or area covered by a dense growth of bushes or shrubs.

Chaining. The process of knocking over, for the purpose of extirpation, pinyon and juniper trees and sagebrush by means of dragging an anchor chain between two large tractors. (BLM)

Climax vegetation. (potential vegetation). The stabilized plant community on a particular site; it reproduces itself and does not change so long as the environment does not change.

Coarse-textured soils. Sand and loamy sand.

Cropland. Land used for the cultivation of plants or agricultural produce such as grains, vegetables or fruit.

Day-night average sound level = (L_{dn}). The long-term sound level, averaged on a power basis, in which the frequency response is filtered using the A-weighting network and a 10 decibel weighting applied to the equivalent sound level during the night-time hours of 10:00 pm to 7:00 am.

Decibel = dB. A unit used to express relative difference in power, usually between acoustic or electric signals, equal to ten times the common logarithm of the ratio of the two levels.

Depth soil. Depth of soil profile; depth to which the roots of common plants penetrate; depth to underlying bedrock, duripan or other resistant layer. Soil depth classes are: very shallow, less than 10 inches; shallow, 10 to 20 inches; moderately deep, 20 to 40 inches; deep, 40 to 60 inches; and very deep, over 60 inches.

Desert Land Entry Program = DLE. A program implemented by the Desert Land Entry Act of 1877 which provided the mechanism for public lands to be removed from federal administration and conveyed to private ownership, only if the soil deemed suitable for crop production and water could be developed for irrigation.

Drainage class. (natural). Refers to the conditions of frequency and duration of period of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low available water capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.
Well-drained soils are nearly free from mottling and are commonly of intermediate texture.
Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and mottling in the lower B and the C horizons.
Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.
Poorly drained soils are wet for long period and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.
Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Fine-textured soils. Moderately fine textured: Clay loam, sandy clay loam, silty clay, and clay. Roughly, soil that contains 35 percent or more of clay.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Forage. All browse and herbaceous foods that are available to grazing animals. It may be grazed or harvested for feeding. (BLM)

Forb. Any herbaceous plant, neither a grass nor a sedge, that is grazed on western ranges.

Forest land. All lands which support trees having a ten percent or greater crown closure, now or potentially. This includes woodlands, commercial forest land, non-commercial forest lands, and productive forest lands, provided the minimum crown closure standard is met. (BLM)

Grazing. The act or practice of allowing livestock to feed on growing grasses and herbage in fields, range or pasture land.

Habitat. The natural abode of a plant or animal; it refers to the kind of environment in which a plant or animal normally lives as opposed to its range, or geographical distribution.

Herb. A plant that dies down annually or after flowering; grasses and forbs, as distinguished from shrubs and trees.

Hunter day. One hunter spending 12 hours hunting or 12 hunters spending one hour each, or any combination of these. (BLM)

Invaders. On range, plants that come in and grow after the climax vegetation has been reduced by grazing. Generally, invader plants are those that follow disturbance of the surface. (Most weeds are "invaders").

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Border - Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.
Basin - Water is applied rapidly to relatively level plots surrounded by levees or dikes.
Controlled flooding - Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation - Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops, or in orchards, to confine the flow of water to one direction.
Furrow - Water is applied in small ditches made by cultivation implements used for tree and row crops.
Sprinker - Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation - Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding - Irrigation water, released at high points, flows into the field without controlled distribution.

Jurisdiction. The territorial range of authority or control.

Leaching. The removal of soluble materials from soils or other material by percolating water.

Mining district. A section of country usually designated by name and described or understood as being confined within certain natural boundaries, in which gold, silver, or other minerals may be found in paying quantities. (BLM)

Multiple use. "...the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced diverse resource uses that take into account the long-term needs of future generations for renewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural, scenic, scientific and historical values". (Section 103, Federal Land Policy and Management Act of 1976).

Noise. Unwanted sound, particularly that which is unexpected, unpleasant, undesired and inteferes with one's hearing of something.

Overgrazing. Grazing so heavy as to impair future forage production and to deteriorate plants, soil or both. Contrasts with undergrazing.

Percentile exceeded sound level = (L_x). The sound level which is exceeded by percent of a specified time period; for example L_{10} represents the noise level exceeded 10 percent of the time for a specified time period.

Permeability. The capacity of rock for transmitting a fluid. Also, the ease with which gases, liquids or plant roots penetrate or pass through

a bulk mass of soil or a soil layer.

Phreatophyte. A plant that habitually obtains its required water supply from the zone of saturation, either directly or through the capillary fringe. (Meinzer, USGS WSP 494, p. 55, 1923).

Playa. The shallow central basin of a desert plain or valley in which water gathers after a rain and is evaporated. (U.S. Geol. Surv., Bull. (613, p. 184).

Prairie. An extensive area of flat or rolling grassland.

Range (or rangeland). Land that, for the most part, produces native plants suitable for grazing by livestock; includes land on which there are some forest trees.

Range improvement. A structure, development, or treatment used to rehabilitate, protect, or improve the public lands to advance range betterment. (BLM)

Range seeding. Establishing perennial grasses of improved reseeding grasses or legumes on rangeland to prevent the loss of soil and water and to restore the productivity of native grassland.

Range site. An area of range where climate, soil and relief are sufficiently uniform to produce a distinct kind of climax vegetation.

Saline-alkali soil. A soil that contains a harmful concentration of salts and exchangeable sodium; or contains harmful salts and exchangeable sodium and is strongly alkaline in reaction. The salts, exchangeable sodium, and alkaline reaction occur in the soil in such locations that growth of most crop plants is less than normal.

Saline soil. A soil that contains soluble salts in amounts that impair growth of plants but that does not contain excess exchangeable sodium.

Sand. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Savanna. A flat, treeless grassland of tropical or subtropical regions.

Scrubland. Land primarily covered with straggly, stunted vegetation (usually trees or shrubs).

Shrubland. Land covered with woody plants of relatively low height, distinguished from trees by having several stems rather than a single trunk.

Slope soil. Percent slope gradient and adjectives used are:

Nearly level.................................0 to 2 percent
Gently sloping...............................2 to 4 percent
Moderately sloping...........................4 to 8 percent
Strongly sloping.............................8 to 15 percent

Moderately steep................................15 to 30 percent
Steep...30 to 50 percent
Very steep......................................more than 50 percent

Sound pressure level = (SPL-dB). Operationally, SPL = 20 x log (P/Pref) where P is the root mean square sound pressure.

Visual Resource Management (VRM). The planning, design, and implementation of management objectives to provide acceptable levels of visual impacts for all Bureau of Land Management resource management activities. (BLM)

Wild rye. Any of various grasses of the genus *Elymus*.

Woodland. Land producing trees that are typically utilized for nonsaw timber products and sold in units other than board feet. (BLM)

CHAPTER 6.0
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APPENDIX 8-A

INTERMOUNTAIN RESEARCH

Archaeology
History
Ethnohistory
Ethnography
Paleontology
Quaternary Geology

100 MAIN STREET • P. O. BOX 32 • SILVER CITY, NEVADA 89428 • (702) 847-0411

March 7, 1983

Mr. Jerry Millett, Chariman
Shoshone Tribe of the Duckwater Reservation
P.O. Box 68
Duckwater, NV 89314

Dear Mr. Millett:

Exxon Minerals Company (EMC) is proposing to acquire approximately 10,000 acres from the Bureau of Land Management (BLM) for the purpose of developing a molybdenum mine and support facilities in the Mt. Hope vicinity, twenty miles northwest of Eureka, on State Highway 278 (formerly Highway 20).

Various studies are now being conducted for inclusion in the Environmental Impact Statement which will evaluate the impacts of the proposed project. Intermountain Research (IMR) has contracted with EMC to conduct cultural resources studies for the EIS; identification of concerns that Indian people may have about the project is a significant part of our work.

The region in which Mt. Hope is located was once occupied by Indian people, traditionally the Western Shoshone. Although there are no reservation lands near the project area, it is important to determine in what ways the land there may be important to Indian people today. A map of the general project area is attached. Your comments and suggestions with regard to Indian land use, and with regard to individuals or groups who may be most directly concerned, will be especially helpful.

Very truly yours,

Cashion Callaway
Project Manager

ec

Attachment

CULTURAL RESOURCES CONSULTANTS

Duckwater Shoshone Tribe

Tribal Government Office
Duckwater, Nevada 89314
Telephone (702) 863-0227

April 19, 1983

Cashion Callaway, Project Manager
Intermountain Research
P.O. Box 32
Silver City, NV 89428

Dear Sir,

Pursuant to the letter received by this office dated March 7, 1983.

The purpose of this letter is to inform you that the Western Shoshone and the United States are presently in the Courts over the question of who owns the land. You may wish to consider this information in your development plans.

Sincerely,

Jerry Millett

Jerry Millett, Chairman
Duckwater Shoshone Tribe

JM/ad

APPENDIX 8-B

APPENDIX 8-B
INFORMATION PERTINENT TO POWER LINE AND STATE ROUTE 278 ACTIVITY

1.0 Introduction

Initiation of the Mt. Hope project has included planning participation by both Mt. Wheeler Power, Inc. (electric power requirements) and the Nevada Department of Transportation (State Route 278 relocation). This Appendix presents pertinent data presented by both groups during the Mt. Hope EIS period. Both Mt. Wheeler Power, Inc. and the Nevada Department of Transportation, would individually apply for right-of-way granting, although the EIS serves to address environmental considerations.

In 1983, Mt. Wheeler Power, Inc. (MWP) provided an Environmental Impact Report (EIR) to allow EIS preparers access to information necessary to evaluate impact extent and to formulate mitigation planning if necessary. Section 2.0 of this Appendix abstracts the MWP EIR and includes notes, as necessary, concerning mitigative changes incorporated into the MWP plan as a result of EIS preparers review.

The Nevada Department of Transportation (NDOT) directly responded to an EXXON request for plans relative to realignment of State Route 278. In response, the NDOT presented a topographic map depicting realignment routing, discussed plans of cultural and surface water (McBrides Spring) avoidance, and provided details of construction workforce personnel, equipment and scheduling. Section 3.0 of this Appendix is limited to a duplicate copy of a detail letter received from the NDOT. The additional data provided by the NDOT has been directly incorporated into Chapters 2, 3 and 4 of the EIS.

2.0 Mt. Wheeler Power EIR Information

The transmission system proposed for the Exxon Mt. Hope Project is a 230 kV a-c system designed to deliver 50 MW from the Mt. Wheeler Power, Inc. (MWP) 230 kV system to the project site.

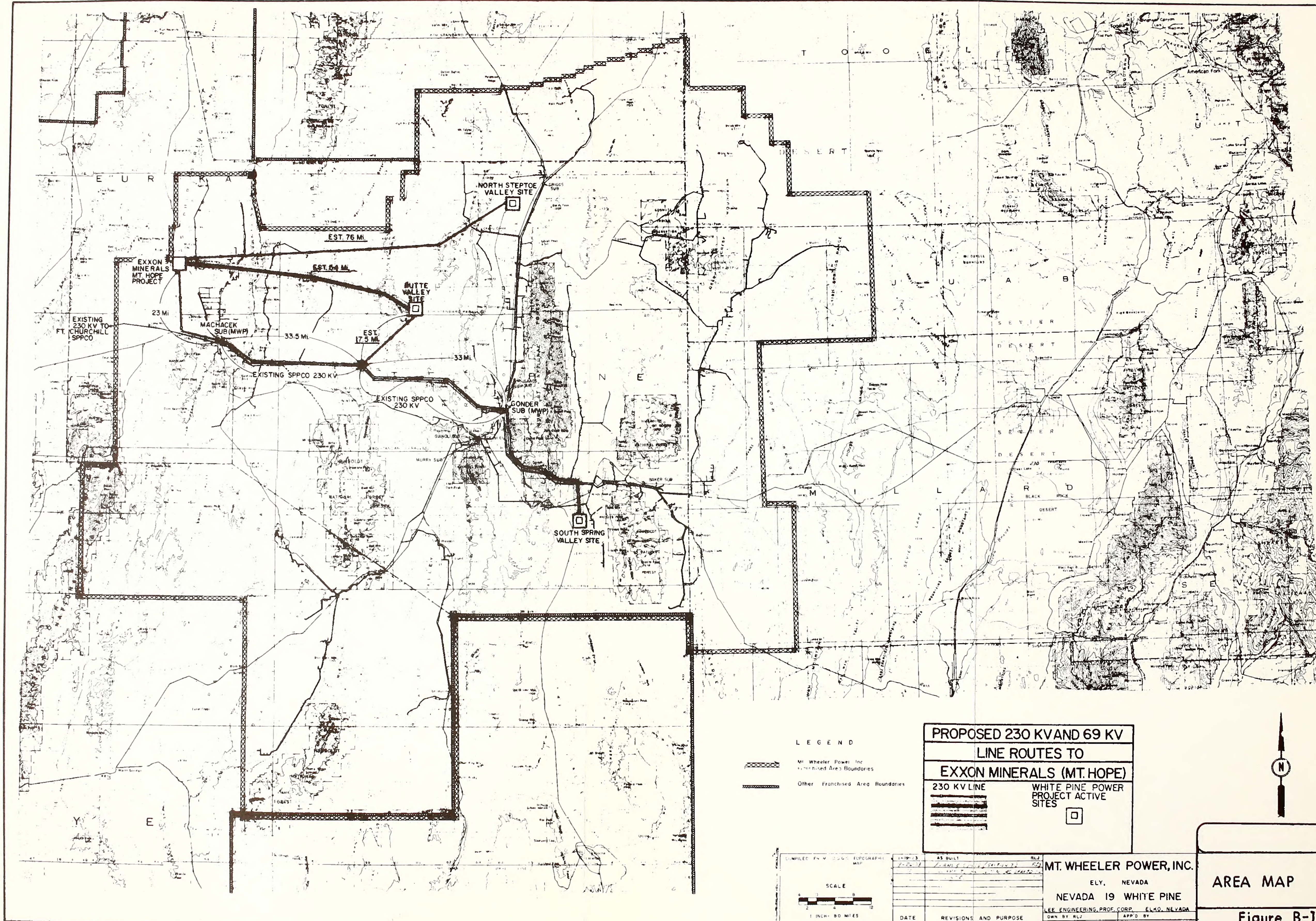
The power requirements for the project are of such magnitude (50 MW), it is assumed that reliability of electric service will require that the project have alternate sources of power to the EMC site. A new 230 kV power line will be constructed to the MWP Gonder Substation near Ely, Nevada from MWP Utah resources by 1985 or early 1986.

In addition, MWP will have additional resources by 1989 from its participation in the White Pine Power Project (WPPP) 1500 MW Plant in White Pine County, Nevada. Construction of this generating plant is scheduled to begin in July, 1984. Three (3) prime sites remain under consideration at the present time and selection for the final location is to be made during June, 1983, providing the selection date remains on schedule (MWP EIR, 1983).

Since the MWP report was being prepared during January, 1983, MWP developed preliminary plans to provide the power requirements of the project from any one of the three (3) White Pine Power sites still under consideration.

2.1 Location

Figure No. B-1 shows the MWP system within its certificated service area. The three (3) prime sites for the WPPP are also shown as well as the proposed routing of the various



AREA MAP

Figure B-1

power line alternatives. (Technical Note: Only that portion of the power line from Machacek substation to the Mt. Hope project site has been evaluated in the EIS. In accordance with the NEPA concept of tiering, the analysis of other-line development by Mt. Wheeler Power has been conducted in other EIS work and is scheduled to occur regardless of the Mt. Hope project development. Additionally, the the EXXON Mt. Hope project plans only incorporate power line access from the Machacek substation as opposed to the various alternatives, e.g., direct access from WPPP, discussed in the MWP information provided below).

a. Assume SOUTH SPRING VALLEY Site selected for WPPP - A 230 kV line would be constructed by the WPPP to the MWP Gonder Substation. From Gonder Substation to the Machacek Substation, a 66.5 Mile 230 kV line would be constructed parallel to the Sierra Pacific Power Company (SPPCO) 230 kV line. From the Machacek Substation, a 23 Mile 230 kV line would be constructed to the Mt. Hope site.

b. Assume NORTH STEPTOE VALLEY Site selected for WPPP - a 76 mile, 230 kV line would be constructed direct to the EMC Plant Site as well as a 23 mile, 230 kV Line from the Machacek Substation to the Mt. Hope site.

c. Assume BUTTE VALLEY Site selected for WPPP - a 54 mile, 230 kV line would be constructed direct to the EMC Plant Site as well as a 23 mile, 230 kV line from the Machacek Substation to the Mt. Hope site.

d. An alternate to (c) above would consist of a 17.5 Mile, 230 kV line constructed southwest to intercept the 230 kV corridor of the SPPCo 230 kV line, then 33.5 miles of 230 kV to the Machacek Substation, then 23 miles of 230 kV line from the Machacek Substation to the Mt. Hope site.

e. The right-of-way requirements for 230 kV power line would vary from 110 to 125 feet in width and would require from 13.3 to 15.2 acres per mile of line.

2.2 Construction Activities

2.2.1 Duration

The duration of the construction of the project is estimated to be 50 weeks if the North Steptoe Valley Site is selected and 38 weeks if the Butte Valley site is selected. The construction period for the other alternative routings lie between the above maximum and minimum periods. Time to construct from the Machacek substation to the Mt. Hope site is estimated to equal 11.5 weeks.

Area to be Disturbed. Some amount of land clearing would be necessary to permit movement of construction equipment. Land clearing would be restricted to the minimum necessary for the safe construction and operation of the line and would consist of crushing and uprooting brush. Clearing of desert vegetation would be restricted to the minimum required for placement of poles, anchors and wire pulling sites.

Pole site clearing would normally require a circular space, approximately on a 5 foot (5') radius to protect the wood poles from wild fires. This clearing, normally an ongoing operation and maintenance activity to protect the pole line from fire, has been eliminated from planning in order to assure minimum environmental disturbance.

Removal of trees would be limited to those that constitute a hazard to the power line and whose tops are within 20 feet of the conductor and

which cannot be topped. The clearing of trees would be done wherever possible after conductor installation to minimize tree trimming or removal to provide a feathered right-of-way.

2.2.3 Construction Labor Force

The power line construction labor force would be composed of the major skills or categories of lineman, groundmen, operating engineers, electrical workers, non-manuals and 'others'. Non-manuals would predominantly be field engineers, surveyors and inspectors. 'Others' would include office personnel and support personnel such as superintendents, foremen, mechanics, fuel and lubemen.

It is estimated that the total labor force necessary to accomplish the proposed construction would number between 45 and 60 people working one eight to ten hour shift a day, five days a week.

2.2.4 Construction Equipment Requirements

Typical 230 kV power line construction equipment would be approximately as follows:

- Cars
- Pickups 1/2 Ton
- Office Trailer
- Dozer
- Road Grader
- 4x4 Pickups
- Truck/Tractor with Auger
- Air Compressor
- Backhoe
- 6x6 Flat Bed Trucks
- Fuel/Lube Trucks
- 25-Ton Crane
- Pole Trailer
- Wire Trailer
- Reel Stands
- Fork Lift
- Conductor/Static Line
- Tensioners
- Traveler Truck with 6-Ton Boom
- Conductor Travelers
- 6x6 with Aerial Platform
- 4x4 6-Man Carry-Alls

2.2.5 Access Roads

Existing public and private roads would be used where available. Some roads may require upgrading to accommodate construction traffic. All existing roads used for construction would be left in the same or better condition than originally found.

New access roads would be constructed along the power line right-of-way where suitable existing roads are not available. Access roads would consist of a main road running the length of the power line right-of-way with stub roads providing access to each structure location. At times it would be necessary to locate access roads outside the right-of-way limits due to geological, ecological or topographical consideration. In these cases, all applicable permits would be obtained and all regulations adhered to.

All access roads would be constructed in accordance with the specifications and regulations of the entity having jurisdiction of the lands crossed.

All fences crossed by the power line would be provided with a gate as required by the landholder, to provide access for the construction force as well as operation/maintenance personnel after construction was completed.

2.3 Maintenance Activitites

2.3.1 Duration

Maintenance would include the operations needed to keep the lines and associated facilities in service. The lines and right-of-way would be inspected during planned periodic ground patrols, approximately two times per year. Emergency patrols by air as well as emergency maintenance on the ground would be performed in

the event of any line failure.

2.3.2 Area to be Maintained Clear of Vegetation

In some cases it may be necessary to clear taller vegetation to aid in fire prevention.

2.3.3 Maintenance Personnel

Routine patrols would consist of a lineman and groundman making a structure inspection of the pole line. In emergencies as many as fifteen (15) to twenty (20) personnel would be utilized to complete repairs as rapidly as possible.

2.3.4 Maintenance Equipment

Vechicles for maintenance would primarily consist of four-wheel drive pickup trucks and rubber-tired winch trucks. Tracked vehicles would be needed only during times of emergency repair.

2.3.5 Access Roads

Access roads constructed during the construction of the power line would be utilized for all maintenance and emergency repair of the line.

2.4 Transmission Structures

2.4.1 230 kV Structure Drawings

Figures B-2, B-3 and B-4 represent standard REA structure drawings for 230 kV Construction. Dimension and conductor spacing is shown for each of these drawings.

Figure B-2 - Tangent Structure (TH-230)
Figure B-3 - Medium Angle Structure (TH-233)
Figure B-4 - Deadend Structure (TH-235)

2.4.2 Structure Hazards

Hazards to people, due to the structures, would be the possibility of collisions with the pole(s) and guy wires by off-road vehicles and aircraft collisions with the structure(s) and conductor(s) during inclement weather. The guy wires would have an 8 foot yellow marker attached from the ground line up the guy strand.

The structure would not be a hazard to livestock or wildlife except for raptors who use the structure as a predatory perch and will be an easy target for the "sportsmen".

2.5 Mitigating Measures

2.5.1 General

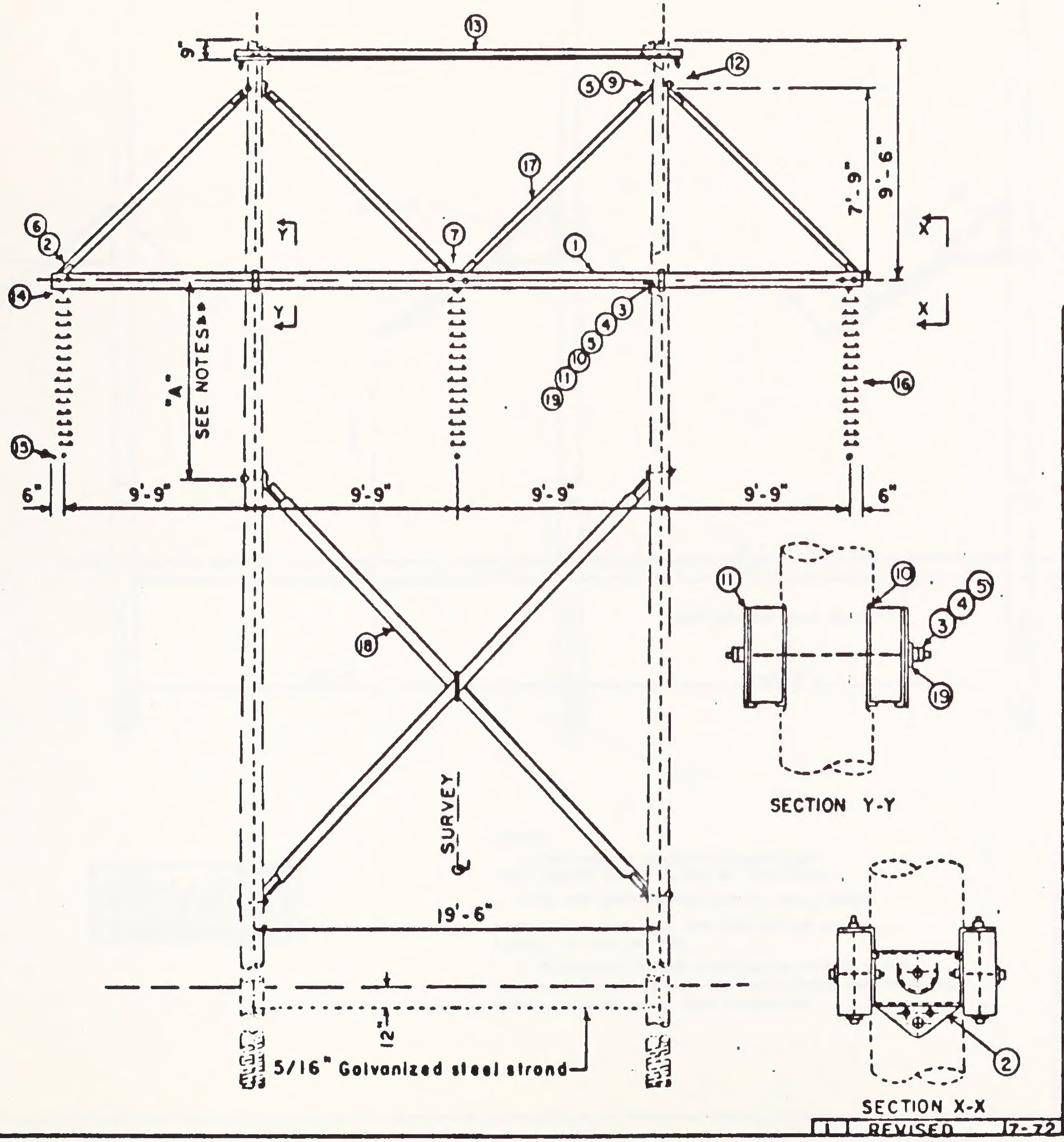
Power lines would be located parallel to existing power line rights-of-way when practicable. Power lines would be located, wherever possible, to use the natural terrain as background on screening.

Existing access roads would be used where practicable. Soil excavated during construction would be evenly distributed over cleared areas. Watering of access road surfaces would be done if necessary to minimize fugutive dust emissions.

2.6 Environmental Criteria

The policy and practice of Mt. Wheeler Power, Inc. is to protect the environment of the service area to the fullest extent practicable within the constraints of technological and economic feasibility while fulfilling its primary responsibility of supplying low cost electric service to its consumers.

In this regard, the design, construction, cleanup, restoration and maintenance of the proposed project



NOTES:

* 1. As required see Drg. TM-1.

2. Cotter keys in insulator strings and clamps shall be oriented in same direction and shall face pole.

3. Any field drilled pole holes shall be pressure treated.

4. Structures shall have suitable pole foundation to resist uplift.

** 5. Dimension "A" shall be as shown on Drg. TM-20[illegible]

6. Double crossarms shall be shipped complete with factory assembled hardware.

7. For other requirements of assemblies refer to Specification T-8.

*** CROSSARM TYPE 81

LIST OF MATERIALS

DRG. REF.	REQ'D	DESCRIPTION
1	2	Crossarm 3 5/8" X 9 3/8" 10'-0" long ***
2	3	Spacer Fitting Ass'y, Separation as req'd
3	2	Threaded rod 7/8" X req'd length
4	4	Nut for 7/8" bolt
5	6	Locknut for 7/8" bolt M.F. type
6	2	Bent bolt 7/8" X 5 1/2"
7	1	Bent stud 7/8" X 8" with th'd washer & nut
9	2	Machine bolt 7/8" X required length
10	4	Gain plate 3" X 9 1/2" X 1/4"
11	4	Ribbed tie plate 3" X 9 1/2" X 1/4"
12	2	Single curved grid plate 4" X 4" Min 15/16" hole
13	1	OHGW support assembly TM 109 B
14	3	Suspension hook
15	3	Suspension clamp and connecting piece
16	*	Insulator, suspension 5 3/4" X 10" X 15,000 lb. M&E
17	4	V-braces 3 3/8" X 5 3/8" X req'd length
18	1	X-brace Assembly TM-110A
19	2	Spring washer 15/16" hole

TRANSMISSION LINE TANGENT STRUCTURE

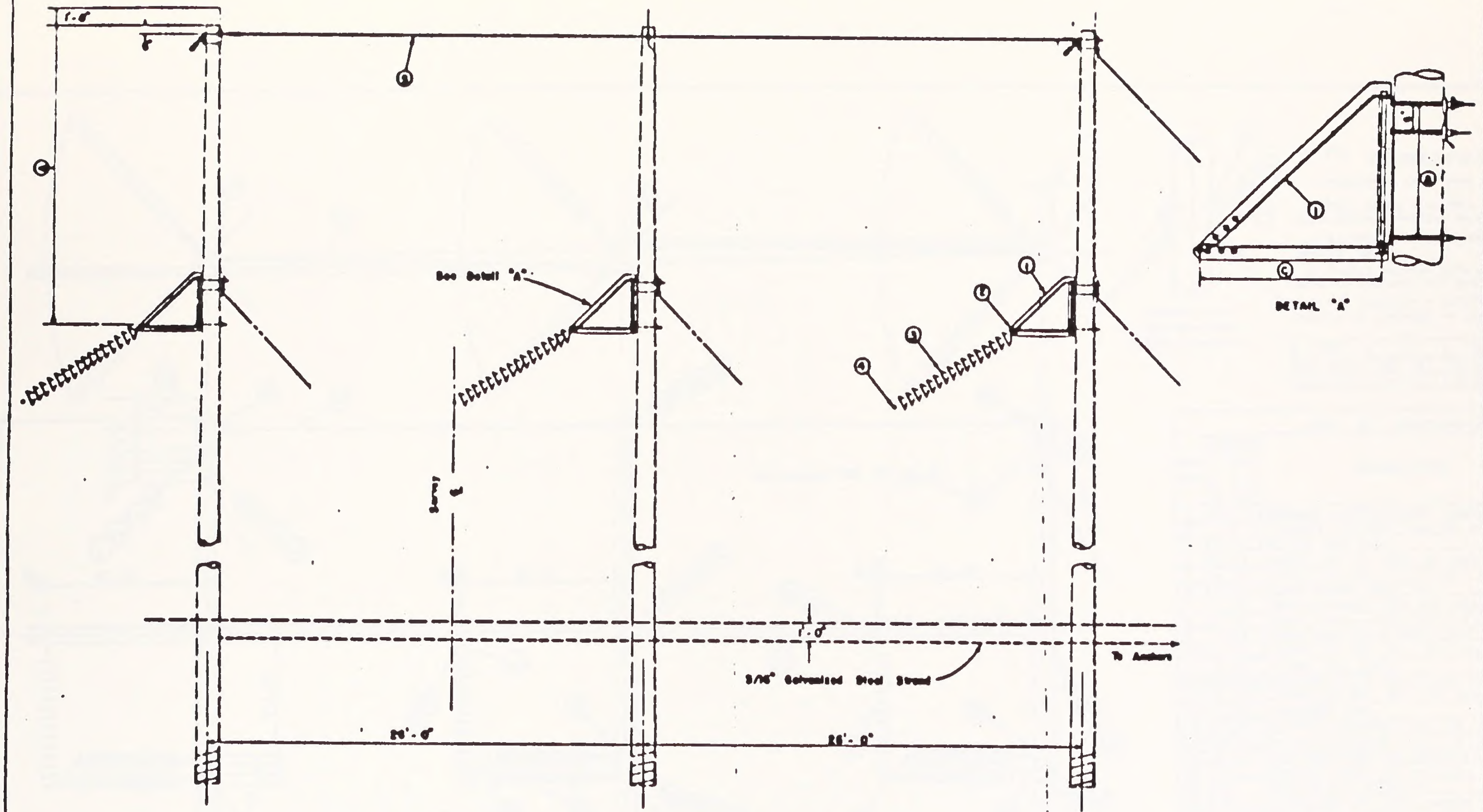
230 KV H-FRAME SUSPENSION - TWO POLE

May 1963

FIGURE B - 2

TM-230

1 REVISED 7-72



Type Structure	A	Dimensions	
TH-23[illegible]	[illegible]	[illegible]	[illegible]
TH-23[illegible]	[illegible]	[illegible]	[illegible]
TH-23[illegible]	[illegible]	[illegible]	[illegible]
TH-23[illegible]	[illegible]	[illegible]	[illegible]

NOTES:

1. Pole spacing to conform to dimensions shown unless otherwise indicated on Plan and Profile sheets.

2. Any field drilled pole holes shall be pressure treated.

3. Tighten machine bolts until grid gain teeth are imbedded full depth into pole.

4. TO ENGINEER: Overhead ground wires are shown for optimum lightning protection and guying. In areas having galloping conductor problems, overhead ground wire may be moved to middle pole.

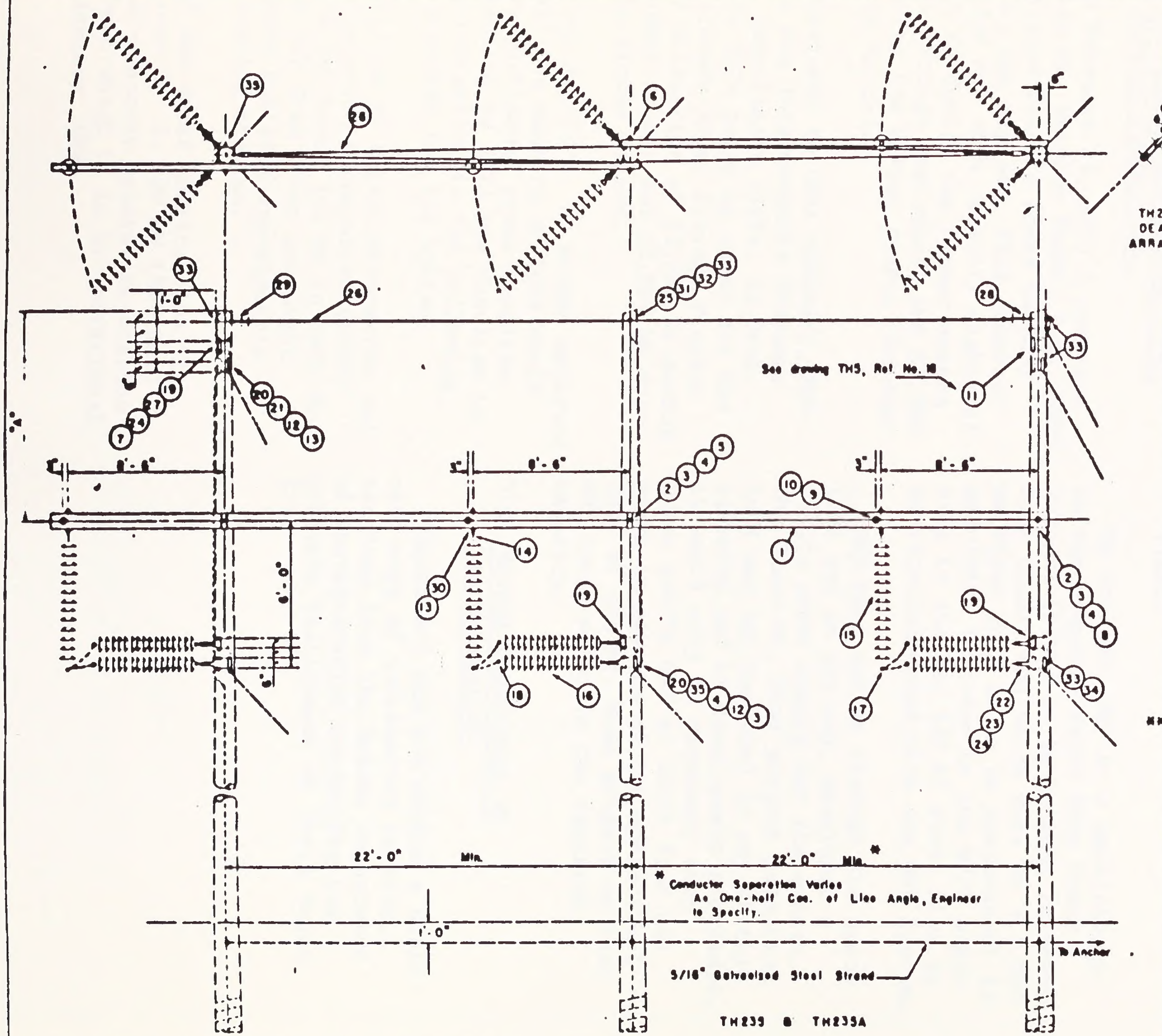
LIST OF MATERIALS

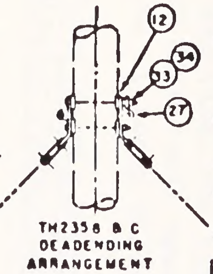
DWG REF	REQ	DESCRIPTION	ITEM
1	3	Angle bracket assembly, TM111A - TM111B	
2	3	Suspension hook, 23000 lb.	[illegible]
3	48	Insulator, suspension, 5 3/4" x 10", 25000 lb. [illegible]	[illegible]
4	3	Suspension clamp and connecting [illegible]	[illegible]
5	1	Pole tie assembly, TM104	

TRANSMISSION LINE MEDIUM ANGLE STRUCTURE
H-FRAME SUSPENSION - THREE POLE
(230 KV MAXIMUM)

FIGURE B-3

[illegible] TH-233 SERIES





NOTES: CROSSARM TYPE 92

1. Engineer to check pole column stability.

2. Pole spacing to conform to spacing shown unless otherwise indicated on plan and profile sheets.

3. Any field drilled pole holes shall be pressure treated.

4. Tighten machine bolts until grid gain teeth are indented full depth into pole.

5. ** Engineer to specify strap lengths required for clearance to guy.

DWG	"A"	DWG.	"A"
TH 235	10'-8"	TH 235B	10'-8"
TH 235A	14'-6"	TH 235C	14'-6"

LIST OF MATERIALS

ORG REF	REQ'D — & A	REQ'D B & C	DESCRIPTION	ITEM
1	2	2	Crossarm, 3 5/8" x 9 3/8" required length	a
2	1	1	Threaded rod, 7/8" x required length	n
3	8	5	Nut for 7/8" bolt	
4	10	7	Locknut for 7/8" bolt, MF type	e
5	4	4	Ribbed tie plate, 3" x 9 1/2" x 1/8"	
6	3	3	Spring washer, 15/16" hole	
7	4	4	OHGW Deadend clamp and connecting piece	l
8	2	2	Washer, square curved, 4" x 4" x 1/4" x 5/16" hole	
9	3	3	Washer head machine bolt, 1/2" x 5" w/ washer nut	
10	3	3	Locknut for 1/2" bolt, MF type	
11	2	2	3-bolt guy clamp	u
12	20	20	Grid gain, 4" x 4" min x req'd hole	
13	5	3	Locknut for 3/4" bolt, MF type	e
14	3	3	Suspension hook	e h
15	39	39	Insulator, suspension, 5 3/4" x 10" - 15,000 lb MBE	
16	96	96	Insulator, suspension, 5 3/4" x 10" - 25,000 lb MBE	
17	3	3	Suspension clamp and connecting piece	
18	6	6	Deadend clamp and connecting piece	
19	10		Deadend tee, 25000 lb	
20	10		Guying plate, 3" x 5/8" x required length 25000 lb	
21	8	4	Machine bolt, 3/4" x required length	c
** 22	6	6	Clevis eye strap, 9" minimum length, 25,000 lb	
23	6	6	Ball eye, 25,000 lb	
24	10	10	Shackle, 3/4", 25,000 lb	
25	2	2	Messenger clamp	
26	1	1	Overhead guy assembly, TG-15	
27		10	Deadend and guying tee, 25,000 lb	
28	1		Guy attachment assembly, TG-21	
29	1	2	Guy attachment assembly, TG-19	
30	3	3	Shoulder eye bolt, 3/4" x 12" with 3 1/2" max. dia. washer nut	
31	1	1	Machine bolt, 5/8" x required length	c
32	2	2	Locknut for 5/8" bolt, MF type	e
33	13	8	Ground wire clamp	
34	13	8	Spring lock washer	
35	14	8	Bolt, machine, 7/8" x required length	c
36	6	4	Nut for 3/4" bolt	

TRANSMISSION LINE
DOUBLE DEADEND STRUCTURE – THREE POLE
(230 KV MAXIMUM)

Scale: none

FIGURE B-4

Date Mar 18, 1965

TH 235 SERIES

2 REVISION T-TZ

NOTE TO ENGINEER: Overhead ground wires are shown for optimum lightning protection and guying. In areas having galloping conductor problems, crossover ground wire may be moved to middle pole.

would follow the applicable criteria in the "Environmental Criteria for Electric Transmission Systems" published jointly by the U.S. Department of Interior and the U.S. Department of Agriculture.

In addition, the stipulations of the jurisdictional agencies involved would be strictly followed.

2.7 Power Supply Planning - Mt. Wheeler Power, Inc.

On February 24, 1971 a contract between Mt. Wheeler Power, Inc. (MWP) and Sierra Pacific Power Company (SPPCO) was signed. This contract provided MWP with capacity rights of 40,000 kW during the summer season (April through September) and 22,000 kW during the winter season (October through March).

Subsequent to this contract, MWP joined the Intermountain Consumer Power Association (ICPA) in Utah whereby ICPA acted as agent for the MWP Colorado River Storage Project (CRSP) allocation of 22,000 kW during the summer season and 12,800 kW during the winter season.

In the mid-70's, it became apparent that all the members of ICPA would require additional power supplies. The planning by ICPA has resulted in MWP participating in the following power supplies for its system.

a. Formation of Desert Generation and Transmission Cooperative (DG&T) which purchased 100 MW in Unit No. 2 of the Utah Power and Light Company Hunter steam-electric generating station.

b. DG&T has under construction its Bonanza No. 1, 400 MW (360 Net) steam-electric generating station in Utah which is to be operational by January, 1985.

c. Intermountain Power Project (IPP) which is constructing a 1,500 MW Plant in Utah and which is to be operational in mid-1986. It is from this plant that a new 230 kV power line will be constructed to the MWP Gonder Substation North of Ely, Nevada to increase capacity to the MWP System. MWP anticipated construction of this line in 1985, prior to operation of the IPP Plant.

On its own, MWP is a participant in the proposed White Pine Power Project (WPPP) to be located in White Pine County and which will be a 1,500 MW Plant that is to be operational in mid-1989. Included in the WPPP planning is another 230 kV power line to be interconnected with the MWP System.

MWP has, acting through its agent ICPA and on its own, developed a future power supply for its system. The Exxon Mt. Hope project potential load was not included in any of this planning and if development proceeded, it would only be necessary that Exxon notify MWP at least four (4) years in advance of the operational date of the Mt. Hope project so that MWP could schedule the required capacity.

3.0 Nevada Department of Transportation

Figure B-5 and B-6 depict a duplicate copy of information in part, received from the Nevada Department of Transportation concerning the proposed realignment of State Route 278.

NEVADA
DEPARTMENT OF TRANSPORTATION

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
1263 SOUTH STEWART STREET
CARSON CITY, NEVADA 89712

TRANSPORTATION BOARD
RICHARD H BRYAN Governor Chairman
BRIAN McKAY Attorney General
DARREL R DAINES State Controller

A E STONE
Director

June 8, 1983

IN REPLY REFER TO
Exxon - Mt. Hope
SR 278

Ms. Kit Krickenberger
Exxon Minerals Company
P. O. Box 4508
Houston, TX 77210

Dear Ms. Krickenberger:

The following information is submitted in accordance with our cooperative Agreement No. R150-83-010. Attached is a map which depicts the general alignment based on previously submitted contours. Also attached is a typical section which shows the anticipated widths, slope configurations and a typical drainage structure crossing.

In general, the 6.0 mile project is estimated to cost $3,400,000 with an estimated start to finish time of one construction season.

Overall cut and fill volumes, paving descriptions, depths and the number and type of drainage structures will not be made available until more detailed design work is accomplished.

A summary of other pertinent details follows:

<u>Area Disturbed During Construction</u>

84 Ft.± width .... 20,592 feet
105 Ft.± width .... 9,504 feet
126 Ft.± width .... 1,584 feet

<u>Area Permanently Disturbed</u>

80 Ft.± width .... 20,592 feet
100 Ft.± width .... 9,504 feet
120 Ft.± width .... 1,584 feet

<u>Equipment Typically on Site During Construction</u>

TYPE	H.P.	POWERED	NUMBER
Dozers D-8	300	Diesel	2
Scrapers 631	450	"	5
Backhoie 1 Cu. Yd.	55	"	1
Loaders 966	200	"	2
Rollers (Pneum.)	100	"	2
Rollers (Steel)	87	"	2
Trucks (Hauling)	200	"	10
Trucks (Water)	150	"	2
Motor Grader 135	180	"	2
Crushing Plant	300	"	1
Hot Plant	100	"	1
Paver	122	"	1

It is estimated a work crew of 30-50 persons will be required working an 8-hour day, 40 hour week. The work crew will likely consist of operating engineers, teamsters laborers and fence erectors.

As an additional note, our Agreement No. R150-83-010 states in the preambles the project extends from approximate mileposts EU 51.44 to EU 56.55. Those are apparently in error with the actual mileposts being EU 15.00± to EU 22.00±. I apologize for any inconvenience this may have caused you.

If you have any questions please contact Bill Bowman, Project Designer at (702) 885-5609 or myself.

Sincerely,

Michael W. McFall

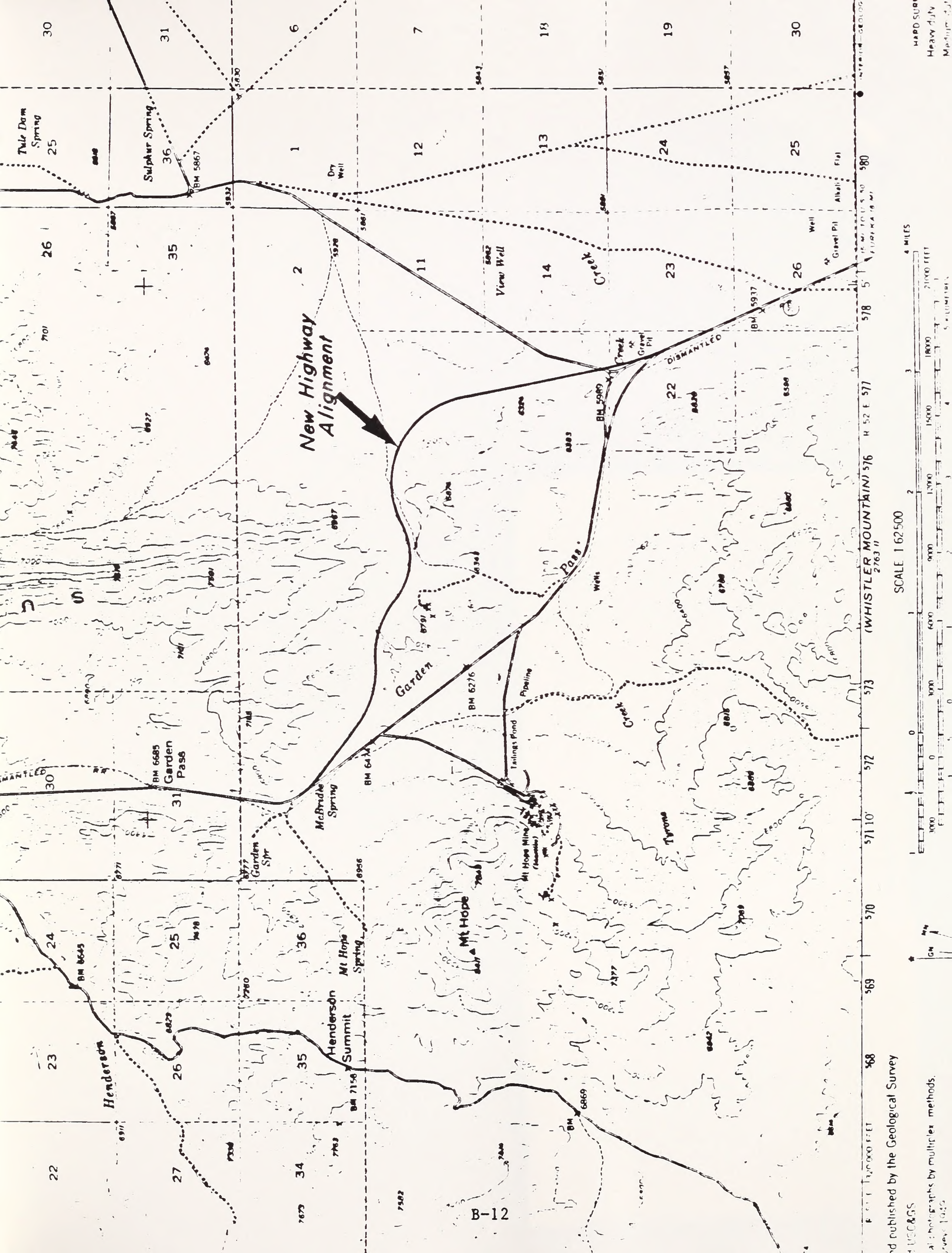
Michael W. McFall
Assistant Chief Road Design Engineer

MWM:kl

Attach.

cc: Jim Cress

FIGURE B-5



New Highway Alignment
Garden Pass
BM 6685
Henderson Summit
BM 7158
Henderson
Mt Hope
Mt Hope Mine
Mt Hope Spring
McBride Spring
Garden Spr
Tailings Pond
Pipeline
BM 6276
Garden
Pass
Creek
Tyrone
Sulphur Spring
BM 5867
Tule Dam Spring
Dry Well
View Well
Gravel Pit
DISMANTLED
BM 5989
BM 5937
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